



Paint and Prevent - An Intervention Study on
The Outcomes of a Visual Arts-Based
Handwashing Workshop for Adolescents in
Tanzania

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visual arts-based handwashing workshop for adolescents in
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Tutkimuksen tavoitteena oli lisätä tansaniaalaisten nuorten käsienspesutietoja ja -taitoja Dar Es Salamissa, Tansaniassa. Tutkimuksen tarkoituksena oli tutkia nuorten käsienspesutietoja- ja taitoja ennen ja jälkeen kuvataideintervention, tutkia osallistujien omia kokemuksia työpajojen hyödyistä, koostaa kuvataidepohjainen infektion torjuntainterventio osallistujien käsienspesutietojen ja -taitojen kartuttamista varten, sekä luoda käsikirja työpajoista jaettavaksi kansalaisjärjestö Art in Tanzania'n kanssa.

Tutkimuksen yhteistyökumppaneina toimivat Laurea Ammattikorkeakoulu, sekä tansaniaalaissuomalainen kansalaisjärjestö Art in Tanzania. ”Paint and Prevent - a guide to visual arts-based handwashing workshop” -opas luotiin ja testattiin yhteistyössä ja luovutettiin Art in Tanzania'n käyttöön projektin päättymisen jälkeen.

Oikeaoppinen käsienspesu voi ennalta ehkäistä ripulitauteja ja hengitystieinfektioita. Nämä ovat tansaniaalaisten 10-19-vuotiaiden tyttöjen ja poikien suurimpien kuolinsyiden joukossa. Covid-19 pandemia on tehnyt käsienspesusta entistä tärkeämpää. Maailmanpankki kertoo Tansanian populaation kasvaneen 45% 15 vuoden aikana. Väestön nopean kasvun vuoksi terveystiedon tarjoaminen nuorille on haaste, mutta sitäkin tärkeämpää. Taiteen eri muotoja voidaan käyttää joustavasti terveyden interventioiden toteuttamiseen, ja Saharan eteläpuoleisessa Afrikalla onkin jo historiaa terveystiedon toteuttamisesta eri taiteen menetelmillä.

Tutkimusasetelmana käytettiin kvasikokeellista interventiotutkimusta, jossa työpajoihin osallistujien käsienspesutiedot ja -taidot testattiin ennen ja jälkeen intervention. Interventio toteutettiin kuvataidetaidepohjaisina työpajoina, jotka suunniteltiin Daisy Fancourtin malliin perustuen. Aineisto kerättiin kyselyillä työpajoihin osallistuneilta nuorilta. Kyselyissä kysyttiin eri kysymyksiä osallistujien käsienspesutaitoja ja -tietoja ennen ja jälkeen intervention. Kolme kysymystä käsiteli osallistujien omia käsienspesutaitoja, ja nämä analysoitiin osana käsienspesutaitoja. Kyselyssä oli myös 11 Totta vai Tarua -kysymystä, jotka käsitelivät käsienspesutietoja ja -taitoja. Osallistujien saamia oikeita vastausmääriä verrattiin ennen ja jälkeen työpajojen. Lisäksi heiltä kysyttiin työpajojen jälkeen kolme kysymystä heidän omasta mielipiteestään työpajojen vaikuttavuudesta. Art in Tanzania järjesti keväällä 2021 käsienspesukampanjan Dar Es Salamissa, jonka aikana he myös keräsivät aineiston tutkimusta varten. Lopulliseen aineistoon hyväksyttiin 37 parillista kyselyä. Eroja eri ikä- ja sukupuoliryhmien välisissä tiedoissa ja taidoissa ennen ja jälkeen työpajojen mitattiin t-testien avulla. Wilcoxonin testiä käytettiin erojen havaitsemiseen ennen ja jälkeen työpajojen. Aineiston perusteella osallistujien tiedot ja taidot paranivat työpajojen aikana, mutta merkittävin nousu havaittiin, kun Totta vai Tarua -kysymyksiä tarkasteltiin summamuuttujan avulla. Erikseen vastaajien tiedot eivät karttuneet yhtä merkittävästi kuin taidot, mutta yhdessä tarkasteltuna merkittävä osuus vastaajista oli saanut paremmat tulokset intervention jälkeen. Osallistujat arvioivat työpajojen olleen hyvin merkittäviä käsienspesutietojen ja -taitojen lisäämisessä, ja maalaamisen helpottaneen oppimista.

Tulevaisuudessa työpajoja voisi toteuttaa eri kohderyhmille, ja eri taidemuotoja käyttäen.

Asiasanat: Tanzania, arts in health, adolescents, handwashing, infection prevention

Emmi Hamara, Noemi Watson

Paint and Prevent - An Intervention Study on the Outcomes of a Visual Arts-Based Handwashing Workshop for Adolescents in Tanzania

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The aim of the study was to increase handwashing skills and knowledge of Tanzanian adolescents in Dar Es Salaam, Tanzania. The objectives were to study the pre- and post-intervention knowledge and skills in handwashing with the participants, to study the participants' experiences of possible benefits in participating in the intervention, to create a visual arts-based infection prevention intervention to increase the participants' knowledge and skills in handwashing, and to create a tested framework for a health intervention to share as a concept with the non-governmental organisation, Art in Tanzania.

The partners of the study were Laurea University of Applied Sciences, and Art in Tanzania, a non-governmental organisation based in Finland and Tanzania. "Paint and Prevent - a guide to visual arts-based handwashing workshop" was created and tested with Art in Tanzania, and the handbook was given to them after the project to use in the future.

Proper handwashing can prevent diarrhoeal and respiratory diseases. Such diseases are a burden for Tanzanian adolescents: in 2015, they were amongst the top causes of death for both girls and boys aged 10 to 19 in Tanzania. The World Bank states that Tanzania as a nation has increased 45% in population in the past 15 years. It is not only challenging to offer their youth health education, but also important to do so. Arts can be used in health education flexibly and different art forms have been used in sub-Saharan Africa, also in Tanzania, in health education before.

The study design was a quasi-experimental intervention study. The intervention was a visual art-based handwashing workshop framework called Paint and Prevent, which was created by applying Daisy Fancourt's (2017) model for designing and delivering arts in health interventions. The study method were pre- and post-intervention surveys. The surveys asked questions about self-reported skills, as well as self-reported outcomes of the workshop. Furthermore, 11 dichotomous True or False questions were asked about handwashing skills and knowledge. These were collected from the workshop participants in Tanzania, and the outcomes were measured using descriptive statistic techniques, comparing paired and independent samples. The staff of Art in Tanzania carried out the handwashing campaign in Tanzania in March and April 2021. They also collected the data for the study. All together 37 (N) paired surveys were accepted in the data analysis. Independent *t*-testing was used for comparing pre- and post-intervention results between different age and gender groups. Wilcoxon's signed ranks test was used to analyse the significance in the differences of the paired samples. The data show that the participants' skills and knowledge did increase during the workshops, with more participants having improved results in the True and False questions. Participants also reported that they had benefited from the workshops. However, when analysed separately from skills, the participants' knowledge in handwashing did not increase significantly. The participants reported their skills and knowledge had increased, and that painting had helped them to learn. The authors suggest the workshop framework be adapted and tested for different audiences, such as younger children. Different art methods could also be used.

Key words: Tanzania, arts in health, adolescents, handwashing, infection prevention

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1 Introduction

United Republic of Tanzania is an East-African country, with a population of 53,470,000 people in 2015 (WHO 2020a). The population of Tanzania has grown fast, by 45 percent in the past 15 years, and this has created a challenge to provide health care and health education for its youth (World Bank 2019). Young people aged between 10 to 24 have limited access to health information and services (WHO 2020a) and instead of having health education taught as its own subject, it is mostly integrated with other subjects (Kayombo 2020). The World Bank (2019) highly recommends Tanzania would put more emphasis on health education for adolescents.

In 2018, the leading causes of death for adolescent girls in Tanzania aged 10 to 19, were lower respiratory infections, malaria, diarrhoeal diseases, HIV/AIDS, and maternal conditions. For adolescent boys, they were diarrhoeal diseases, lower respiratory infections, HIV/AIDS, malaria, and road injuries. (WHO 2018a.) In 2016, the probability for dying between 15 and 60 years in Tanzania was 299 (males) and 222 (women) per 1000 persons. Life expectancy for women was 66, and for men just 62. (WHO 2020b.) Good handwashing strategies implemented in the right way may prevent disease and death including common diseases such as diarrhoea, pneumonia, common colds, and flu. Appropriate hand hygiene could prevent up to 165,000 diarrhoeal related deaths annually. (UNICEF & WHO 2020, 3.)

European Centre for Disease Prevention and Control (ECDC 2020) report that health education aims to positively influence a person's health related knowledge, attitudes, and behaviours, and informs them about lifestyles and behaviours that prevent illness. Through it, people can learn how to take care of their own and others' health. World Health Organization (WHO 2018b) state that by increasing people's knowledge and social skills they can be helped to make healthier choices and decisions which affect them and their families.

Arts can be utilised in health education in many ways. The term "arts in health" refers to for example activities that aim to improve individual or community health through arts (White & Hillary 2009, 2; Fancourt 2017, 68), or activities that bring together the skills and priorities of arts and healthcare professionals (Arts Council of Ireland 2010; Fancourt 2017, 68). Arts in health projects can aim at acquisition of art and craft skills, social activity and participation, staff development for health care professionals, health needs assessment, communication between consumers and the health care agencies and cross-sectional partnership working. However, they rarely aim directly at improving the participants' health. (Angus 2002; Macnaughton, White & Stacey 2005.) Studying arts in health may help producing knowledge, understating phenomena, and engaging stakeholders (Fancourt 2017, 191).

This study and its aim and objectives were created by two master's students at Laurea University of Applied Sciences. The potential to combine visual arts, health education and global health promotion were the driving factors behind the study. Throughout the project, a great emphasis was put on providing real life, practical and useful results for the field of global health promotion to use. The aim was to increase the participants' knowledge and skills in handwashing, and the objectives were to create a visual arts-based handwashing workshop framework, and measure its outcomes, as well as to measure the workshop participants' before and after knowledge and skills in handwashing. The target group were Tanzanian adolescents aged 15 to 17, although for practical reasons, 18-years-olds and above were also included in the study.

This study investigates combining a visual arts-based approach to health education with the challenges Tanzanian youth faces in handwashing skills and knowledge. The intervention was a visual arts-based handwashing workshop. Participants filled in pre- and post-intervention surveys and the results were analysed with the SPSS data analysis program. The participants also answered 3 questions about their experiences of the workshop. An intervention study design was used, and the intervention was created by applying Daisy Fancourt's (2017) model for arts in health intervention research book. The Covid-19 pandemic laid its own challenges to the planning and implementing of the study and the workshops.

The project's partner, Art in Tanzania is a non-governmental organisation and a Laurea University of Applied Sciences' collaboration partner. Art in Tanzania was founded in 2001 by two local artists in Tanzania. Since then it has grown into an organisation that has over 300 international volunteers and internships annually. Art in Tanzania is registered in Tanzania, Zanzibar and Finland, and acts in several different sub-specialties: medical and healthcare practice, social work, social media, HIV/ AIDS awareness, arts and music, and sports. The organization aims to be self-sustainable in its operations, as well as supporting of the most vulnerable members of the community. Art in Tanzania states its mission as "to promote the development of the most vulnerable communities in Africa developing partnerships with international NGOs, Universities and the corporate sector" (Art in Tanzania 2020.) The contact person throughout the study was Kari Korhonen, an NGO coordinator at Art in Tanzania.

2 Background

2.1 Arts in health

Arts in health can be defined in many ways, and there is no standardised definition that exists (Fancourt 2017, 68). The term may be defined as "creative activities that aim to improve

individual or community health using arts-based approaches, and that seek to enhance healthcare delivery through provision of artworks or performances” (White & Hillary 2009, 2; Fancourt 2017, 68), or “a range of arts practices occurring primarily in healthcare settings, which brings together the skills and priorities of both arts and health professionals” (Arts Council of Ireland, 2010 ; Fancourt 2017, 68). Sometimes arts in health activities are referred to as “arts and health”, highlighting the equal weight both worlds have together, and sometimes as “arts for health”, referring to an intervention having a more advocacy role. On the other hand, the term “arts in health” refers to using arts as a supportive tool for health care systems or individual health (Fancourt 2017, 68.) The “arts in health diamond” (Figure 1) (Macnaughton & al. 2005; Fancourt 2017, 69) describes the arts in health projects to be situated somewhere within art or health services, and society or the individual, moving towards different aspects. Arts in health differs from art therapy in the sense that the artists involved in it are not trained therapists (Macnaughton & al. 2005).

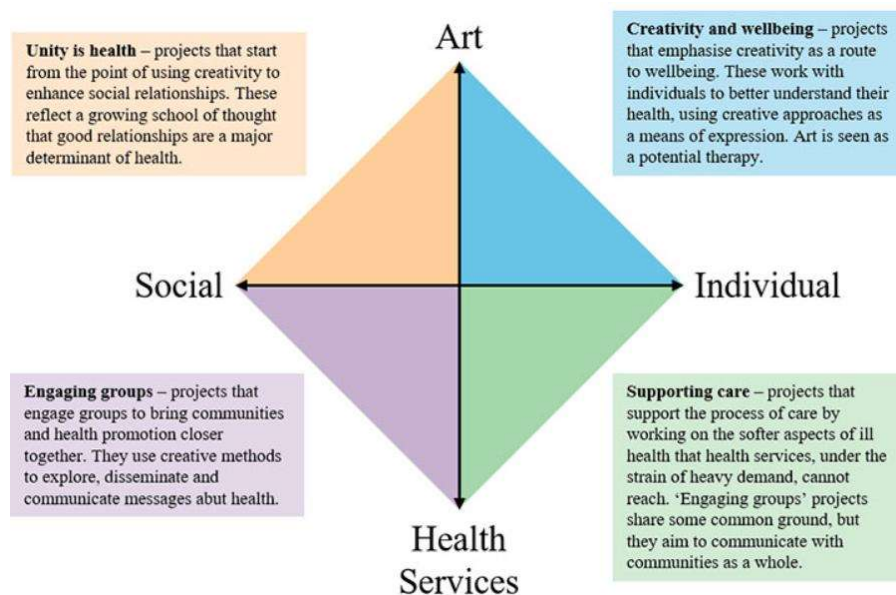


Figure 1: Arts in Health Diamond in Macnaughton and al. 2005 (Revised copy published with the permission from Professor Macnaughton)

Arts in health projects may have a variety of aims: they can aim at acquisition of art and craft skills, social activity and participation, staff development for health care professionals, health needs assessment, communication between consumers and the health care agencies and cross-sectional partnership working. However, they rarely aim directly at improving the participants’ health. (Angus 2002; Macnaughton & al. 2005.) Arts can be used for health interventions very flexibly. For example, they can be utilised as a tool of communication in health education and can be beneficial in improving health outcomes, in promoting public

wellbeing, and may generate self-reflection and self-awareness (Logan & Siegel 2017). One form of the tool is visual literacy, which can be used to advance health literacy. Visual literacy means the ability to interpret, understand and act upon information in visual form. It helps to construct meaning from images. A viewer goes through a process of observing, seeing, and analysing an image, reflecting it against their own cultural background. Exposure to arts, encouraging reflection and advancing health literacy can result in enhanced health behaviours and outcomes. (Logan & Siegel 2017.)

A broad range of art forms can be utilised as a tool in arts in health interventions, and they can focus on any major health issue. The same applies to the target group: people at risk, those having a condition, and recoverees, their families, friends and even health care staff could all be a target group of an arts in health intervention. (Fancourt 2017, 68.) Bianchi (2014) used a visual arts program with adolescents for empathy development in school settings and found out that visual arts with adolescents is a tool for self-exploration. Lansdown and al. (2002) studied the effects of songs, poetic dramas, short plays, and discussions to enhance health education in primary schools in Tanzania. Children were able to pin-point what may be important for their health but recognizing the reasons why something may be beneficial or harmful was not always known. This information was beneficial for teachers regarding their future health education lessons. Bunn and al. (2020) found in their scoping review that all forms of arts have been and could be used for health promotion in sub-Saharan Africa. They studied 119 papers, and found the use of TV/radio, visual arts, film, photography, photovoice, storytelling folk media, such as dance, and craft, as well as even circus, comedy and puppetry, to have the capability to engage participants in changes which are beneficial for health. (Bunn & al. 2020.)

Arts can teach children self-efficacy beliefs as well as originality, an important part of creativity (Catterall & Pepler 2007). Learning originality may lead to having an expansive view of the world. These outcomes may be beneficial, especially for children raised under educationally and socially underprivileged backgrounds. Art also challenges a child in a cognitive way: they struggle and try to learn a technique, while receiving feedback from peers and teachers, and facing the publicity of a classroom. Although facing these challenges through learning other subjects, art room sessions may lead to a child responding more actively and deeply. (Catterall & Pepler 2007.)

Research, even to answers obvious questions is done for four reasons: confirmation, something may seem obvious in theory, but in practice it may not be accurate; influence, to influence perceptions and policies repeated proof of a phenomena is needed; mechanisms, it is not always clear why something happens even though it is known what the results are; and variation, in research variation between ages, cultures, socio economic backgrounds may affect how the intervention is interpreted and experienced. (Fancourt 2017,191.) Studying

arts in health helps address these same issues: it may seem the study question is “common-sense” or very basic, but systematic investigation may bring up new aspects and ideas not thought of before. Studying arts in health interventions may also help understand the extent and nature of phenomena in the field, engage stakeholders, and produce knowledge that is generalisable. Research can support development in the field of arts in health. (Fancourt 2017, 191.) However, a researcher needs to be cautious about their study methods: Sometimes the quantitative methods deployed for arts in health studies may over-estimate the effects of the interventions. Inequality between participants and researchers may also be problematic, as well as culturally inappropriate interventions. (Bunn & al. 2020.)

2.2 Adolescents as health learners

Globally, adolescents are among the most at-risk populations in health care and they consume the least of any health services. A big challenge in educating adolescents in health care is the development of a mutual trust and understanding between the educator and adolescent. The addressed age group undergoes the developmental teenage years during which they face physical, cognitive, and psychosocial development while stepping towards adulthood. During this developmental stage adolescents have a hard time aligning with authorities or adults. To provide a safe space for an adolescent educational environment one should aim for a mutually trusting quality, a visible, confidential, flexible, and affordable way for approaching teenagers. (Bastable 2019, 188-190.)

Adolescents have a great capability for learning new skills, hence they can, e.g., conceptualize and internalize ideas, understand multiple effects and causes of illness, search and interpret data into conclusions, understand multiple-step directions, identify health behaviours and develop explanations and possibilities. (Bastable 2019,188-189). In addition, adolescents can recognize “that illness and disability are processes resulting from a dysfunction or non-function of a part or parts of the body and can comprehend the outcomes or prognosis of an illness” (Bastable 2019, 189).

For short-term and long-term learning, the objectives of adolescent health should focus on health promotion and interventions to serve the greater good of the population (Bastable 2019,188). Nursing strategies for facilitative learning have two categories: *learning* and *remembering*. In the learning stage, themes such as environmental, manipulation, rest period, relaxation techniques, reduced stimulus and overload are addressed. In the remembering stage, repetition, rehearsing, and overlearning are addressed. (Bastable 2019, 209.)

2.3 Handwashing in infection prevention

Handwashing plays a crucial role in infection prevention. Unfortunately, 40% of the world's population live in areas where water and soap are inaccessible. Lack of access hits mostly the poorest countries and vulnerable groups, such as children, families, areas of conflict, migrants, and refugee camps. 900 million school children, the equivalent of almost half of all school-aged children lack handwashing facilities. (UNICEF & WHO 2020, 2.)

Good handwashing strategies implemented in the right way may prevent disease and death including common diseases such as diarrhoea, pneumonia, common colds, and flu. Appropriate hand hygiene could prevent up to 165 000 diarrhoeal related deaths annually. (UNICEF & WHO 2020, 3.) Handwashing education “reduces respiratory illness, like colds, in the general population by 16-21%” (Aiello, Coulburn, Perez & Larson 2008; CDC 2020b), and reduces absenteeism of school children due to gastrointestinal illness by 29-57% (Wang, Lapinski, Quilliam, Jaykus & Fraser 2017; CDC 2020b). In comparison, the lack of handwashing annually takes the lives of 1.8 million children under the age of five around the world by infecting them with pneumonia or diarrheal diseases. Furthermore, proper hand hygiene can not only prevent one from being infected by antibiotic resistant pathogens but also reduce the amount of sickness that leads to overuse of unnecessary antibiotics. (CDC 2020b.)

Diseases causing diarrhoeal symptoms can be bacteria, virus, or parasite based. Diarrhoeal diseases can be water or foodborne caused, and often transmitted by nutrition. Pathogens causing diarrhoea can also be transmitted from droplet infections from other humans or animals (Duodecimlehti 2012.) One gram of human faeces can contain up to one trillion pathogens, such as E. coli, Norovirus, Salmonella and Adenovirus (CDC 2020c.) Pathogens can be transferred through the hands and surfaces of others, as well as after having used the bathroom or changing diapers. Normal human flora is considered as unharmed micro-organisms living in the body serving an important role of e.g., producing low level antibodies against infections and vitamins through digestion, but if the normal flora of one site of a body are transferred to another, they might cause infections, thus all human bodily fluids are considered as a possible source of infection. (Ward 2016, 19.)

Infectious bacteria live underneath fingernails, thus handwashing and keeping our nails short prevent pathogens from spreading (Ward 2016, 121). CDC (2020a) suggest that pathogens spread via hands, when touching one's eyes, nose and mouth if hands are unwashed, eating and preparing food with unwashed hands, touching contaminated objects or surfaces, or when blowing one's nose, coughing, or sneezing and then touching other people's hands or shared objects.

Using soap is an important part of hand hygiene. Diarrhoeal diseases and pneumonia kill each year about 1.8 million children under the age of 5, the two diseases being top two killers of

young children around the world (Liu & al. 2012; CDC 2020b). One out of every 3 children who get sick with diarrhoea, and nearly 1 out 5 children getting sick with respiratory infections could be protected via handwashing with soap (Aiello & al. 2008; CDC 2020b). However, it is estimated that the global rate for handwashing after using the toilet is just 19%, and very few people use soap when handwashing (Freeman & al. 2014; CDC 2020b). Washing hands with non-antiseptic soap removes more germs than washing with water only: Burton, Cobb, Donachie, Curtis and Schmidt (2011) found that washing with soap can reduce the presence of bacteria found in faecal material to just 8% of 400 tested samples, compared to washing with only water which reduced the presence of bacteria to 23% of 400 samples, after touching contaminated surfaces.

In adults, but especially in younger children, handwashing alone, or combined with antiseptics, barrier methods and isolation of likely respiratory infections cases may prevent infections (Terveysportti 2019; Jefferson & al. 2011). If there is no access to soap, wood ash may be used as an alternative washing substance with running water (Howard & al. 2002). If water and soap are not available, alcohol-based hand-sanitizer or baby wipes can also be used. However, baby wipes are not designed for the removal of pathogens, so water and soap are preferred (CDC 2020e).

According to WHO (2009), a proper handwashing has 10 steps: wetting hands, applying soap, rubbing hands palm to palm, rubbing palm and dorsum together, rubbing palms together with interlocked fingers, rubbing backs of fingers, rubbing thumbs, rubbing fingertips, rinsing, drying, and closing the tap with a paper towel. CDC (2020a) suggest the following five steps: wetting hands, lathering soap, scrubbing, rinsing, and drying. Ward (2016, 122) also suggest that handwashing routines should involve wet hands under running water, the usage of soap, thorough assessment of all areas of hands, proper rinse, and the ability to dry one's hands completely dry. The correct duration for handwashing is about 20 seconds, also measurable by singing the "Birthday song" twice (NHS 2019; CDC 2020c).

Running water is an essential part of handwashing to avoid contaminated water (Palit & al. 2012; CDC 2020c), but the water should be stopped after wetting one's hands to prevent wasting water (CDC 2020c). The temperature of the water does not matter, but cool water may cause less skin irritation and is more environmentally friendly than warmer water (Carrico & al. 2013; CDC 2020c). Using soap lifts soil and microbes from the skin (Luby & al. 2005; CDC 2020c). Rubbing one's hands together increases the removal of dirt, grease and microbes from the skin, and the whole hand needs to be scrubbed. Microbes are especially high in concentration under fingernails, but also all over the hands. (Gordin & al. 2007; CDC 2020c.) Rubbing for about 20 seconds helps to remove microbes, but not necessarily too many illness causing ones (Luby & al. 2007; CDC 2020c). Rinsing one's hands helps to remove the microbes with soap and lessen skin irritation from the soap. Drying them with a clean towel,

or air drying them stops new microbes from attaching to the wet skin. (Todd & al. 2010; CDC 2020c.)

According to CDC (2019a), the correct time to wash one's hands are: Before, during, and after preparing food; before eating food; before and after caring for someone at home who is sick with vomiting or diarrhoea; before and after treating a cut or wound; after using the toilet; after changing diapers or cleaning up a child who has used the toilet; after blowing your nose, coughing, or sneezing; after touching an animal, animal feed, or animal waste; after handling pet food or pet treats, and after touching garbage. Additionally, CDC (2020d) suggest more frequent handwashing during the Covid-19 pandemic, especially after being in public places and touching items and surfaces possibly touched by others, as well as before touching one's eyes, nose, or mouth.

Teaching a child handwashing includes teaching the basic elements of it, but also giving them frequent reminders to wash their hands. It also includes telling them the correct times for handwashing and leading by example. Handwashing could also be made fun through games or songs. (CDC 2020e.) Teaching handwashing can also help people and communities to stay healthy (CDC 2020d).

2.4 Infection prevention in Tanzania

In 2018, the leading causes of death for adolescent girls in Tanzania aged 10 to 19 were lower respiratory infections, malaria, diarrhoeal diseases, HIV/AIDS, and maternal conditions. For adolescent boys, they were diarrhoeal diseases, lower respiratory infections, HIV/AIDS, malaria, and road injuries. (WHO 2018.) In 2016, the probability for dying between 15 and 60 years in Tanzania was 299 (males) and 222 (women) per 1000 persons. Life expectancy for women was 66, and for men it was just 62. (WHO 2020b.)

Tanzania as a nation has increased 45 percent in population in the past 15 years, making it a challenge to provide necessary health care and health education for its youth (World Bank 2019). The World Bank (2019) highly recommends that Tanzania would place more emphasis on health education towards adolescents, this would also be a part of reaching for the sustainable development goals. According the World Health Organization (WHO 2020a), adolescents aged between 10-24 years face limited access to health information and services in the United Republic of Tanzania. However, health education is not taught as a separate subject in schools; it is rather integrated into other studies (Kayombo 2020).

The Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDEC) in Tanzania, along with WHO, reported in the Tanzania Mainland Global School-based Health Survey Country report (GSHS) that the hygiene health behaviour between adolescents in Tanzania is ranked poorer than the global average of the 98 countries that participated in the

research (MoHCDEC 2017). The research showed that hand hygiene practices of adolescents aged between 13 to 17 in Tanzania were lacking: 8.1% of adolescents never or rarely washed their hands before eating and 19.1% never or rarely washed their hands after using the toilet. 47.6% of the survey participants answered that clean water was not accessible at school faculties. (MoHCDEC 2017.)

3 Aim and objectives

The aim of the study is to increase the handwashing knowledge and skills of adolescents aged 15 to 17 in Tanzania in assistance of a visual arts-based infection prevention campaign.

The objectives of the study are:

- 1) To study the pre-intervention knowledge and skills in handwashing with the participants.
- 2) To study the post-intervention knowledge and skills in handwashing with the participants.
- 3) To study the participants experiences of the benefits in participating in the intervention.
- 4) To create a visual arts-based infection prevention intervention to increase the participants' knowledge and skills in handwashing.
- 5) To create a tested framework for a health intervention to share as a concept with Art in Tanzania.

4 Designing and delivering an arts in health intervention

According to Fancourt (2017, 103), designing and delivering an arts in health intervention has two phases: conceptualising and planning, and implementing and evaluating. They consist of seven steps: mapping the environment, gaining concrete experience, conducting reflective observation, undertaking abstract conceptualisation, carrying out active experimentation, reviewing and acting, and reconnecting.

The visual arts-based workshop framework, Paint and Prevent, was created implementing these seven steps (Table 1).

Conceptualising and planning	
Mapping the environment	Finding a project partner PICO(t) model Identifying the target group
Gaining concrete experience	Discovery interviews Background search on handwashing in infection prevention and adolescents' health challenges in Tanzania; creating a literature table
Conducting reflective observation	Identifying the 10 key objects from background material Naming the workshop framework Deciding the study method and design
Undertaking abstract conceptualisation	Creating the framework Creating the framework handbook Creating the pre- and post-intervention surveys
Carrying out active experimentation	Piloting the workshop and surveys
Implementing and evaluating	
Reviewing and acting	Instructing Art in Tanzania staff Carrying out the workshops in Tanzania Data collection Data analysis Making changes to the framework based on the results of data analysis
Reconnecting	Handing the tested workshop framework to Art in Tanzania Publishing the results on Global Window and Theseus

Table 1: Designing and delivering the intervention (adapted from Fancourt 2017)

4.1 Conceptualising and planning

On conceptualising and planning, the intervention is planned based on information search on the target group and its needs, using various sources.

4.1.1 Mapping the environment

Mapping the environment means actions that aim at understanding the environment in which the intervention is intended to happen, as well as its needs. As different environments provide different opportunities, it needs to be decided if an intervention is meant for macro level, such as national, or micro level, such as organisational environment. (Fancourt 2017, 103). Tools such as PESTLE analysis can be used for this (Fancourt 2017, 104.) For this study, a PICO(t) model was used (Table 2) instead of PESTLE to help identifying the environment and its needs, as well as to help in background search. A PICO(t) model (population, intervention, comparison, outcome of interest, and time), can be used in intervention research to help in background search to identify for example useful keywords to begin the intervention process (Melnyk & Morrison-Beedy, 2012, 6.)

Population	<ul style="list-style-type: none"> Tanzanian adolescents aged 15 to 17 years
Intervention	<ul style="list-style-type: none"> Visual arts-based infection prevention campaign focusing on handwashing skills and knowledge
Comparison	<ul style="list-style-type: none"> Measuring the participants' skills and knowledge in handwashing before and after intervention
Outcome of interest	<ul style="list-style-type: none"> Increase in the participants' skills and knowledge in handwashing Create a framework for the partner organisation
Time	<ul style="list-style-type: none"> Comparing pre- and post-intervention data collected before and after workshops

Table 2: PICO(t) model for the handwashing intervention campaign

The project partner, Art in Tanzania, was found in Tuudo, an application that gathers important information for Laurea UAS' students, including training placements. The target group of the intervention was also selected based on the partner's location.

4.1.2 Gaining concrete experience

Gaining concrete experience means gaining more information on the target group's needs (Fancourt 2017, 107). This process started by finding more information about the health education needs of Tanzanian youth, general information on handwashing and how an arts in health intervention could be used in health promotion. A literature table of related studies was created to find concrete information on the topic. Related material, such as methodology and nursing study books, as well as World Health Organization, CDC, and other health information sources, were also used. Personal discussions with for example representatives of Art in Tanzania and Mr. Kayombo, a dean and lecturer from the Faculty of Education in the University of Dar es salaam, were used to better understand the needs of the target group, as well as those of Art in Tanzania. Fancourt (2017, 109) calls such discussions discovery interviews which aim to find more about the target group's care processes, and their needs.

The targeted age group was decided based on WHO (2018a) statistics on the burden of adolescents' mortality in diseases such as diarrhoea and respiratory infections between adolescents aged 10-19. Authors decided on targeting on secondary school aged children, ruling out adolescents under the age of 15. The final age of the participants was 15 to 18 and over, including one 19 -year-old, due to practical reasons in Tanzania.

4.1.3 Conducting reflective observation

Conducting reflective observation means making concrete plans based on the first two steps, through more thorough research (Fancourt 2017, 111). In this study, information on the needs of the target group, as well as those of Art in Tanzania, were further discussed with Art in Tanzania's coordinator Kari Korhonen. Also, information on previous art interventions was collected. Based on the information found during the first two steps, the learning needs, as well as the knowledge wished to transfer to the target group were identified and conceptualised into ten key items (Appendix 1). Gray, Grove and Sutherland (2017, 109-110) say a *conceptual definition* means identifying the meaning of an idea. They state it helps the researcher to be clear on what is studied, and helps the audience realise what is being studied. *Operationally defining* a concept defines how it will be measured (Gray & al. 2017, 110.)

In this study, the concepts being studied were adolescents' handwashing skills and knowledge. The conceptualisation process was done manually by reading through the background material together between the authors. The concepts were located from the material based on how frequently they seemed to appear (Table 3). The exact number of each item was not calculated in any statistical way, but rather based on the authors' own knowledge on the topic and the important items within it. Also, information on local and global conditions in Tanzania wanted to be included in the material to make it more audience appropriate.

Background material and manually locating concepts →	Frequently appearing items →	Ten key items, learning needs and knowledge to be transferred
	Current global and local issues →	

Table 3: Conceptualisation process of the ten key items

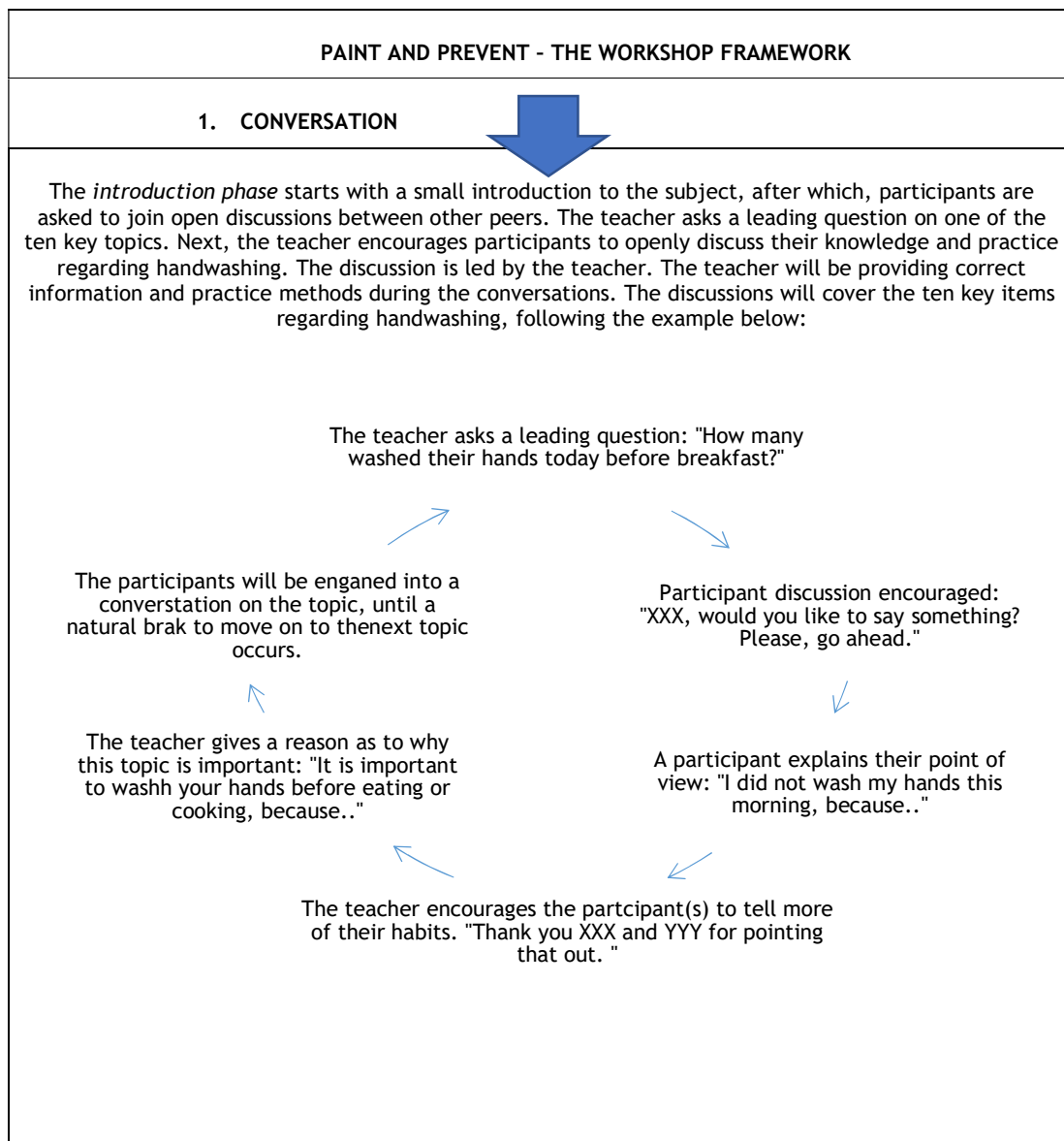
They were divided into ten easy-to-understand key items (Appendix 1), which concerned skills (how to wash your hands): soap, timing, drying, technique, running water and knowledge (why wash your hands): preventing illness, locating pathogens, routes of transmission, global infection prevention, accessibility.

The workshop framework was named as Paint and Prevent, to reflect its content and core idea to teach the participants handwashing skills and knowledge through visual arts.

4.1.4 Undertaking abstract conceptualisation

Undertaking abstract conceptualisation may either be the first time the concept of an intervention is being discussed, or all the previous steps may have been carried out to strengthen the idea of for the concept (Fancourt 2017, 116). The intervention was formatted into a workshop (Figure 2), and its structure was designed. This step was used to put ideas and the key items found through previous steps, into a concrete framework of a workshop, which, in turn were further developed into a framework handbook.

The workshop framework was divided into three sections: introduction, creating visual art, and reflection. Its content was made to include more reflection and repetition of thoughts, rather than assuming one-way teaching process from the teacher to the participants.



Continues to page 20

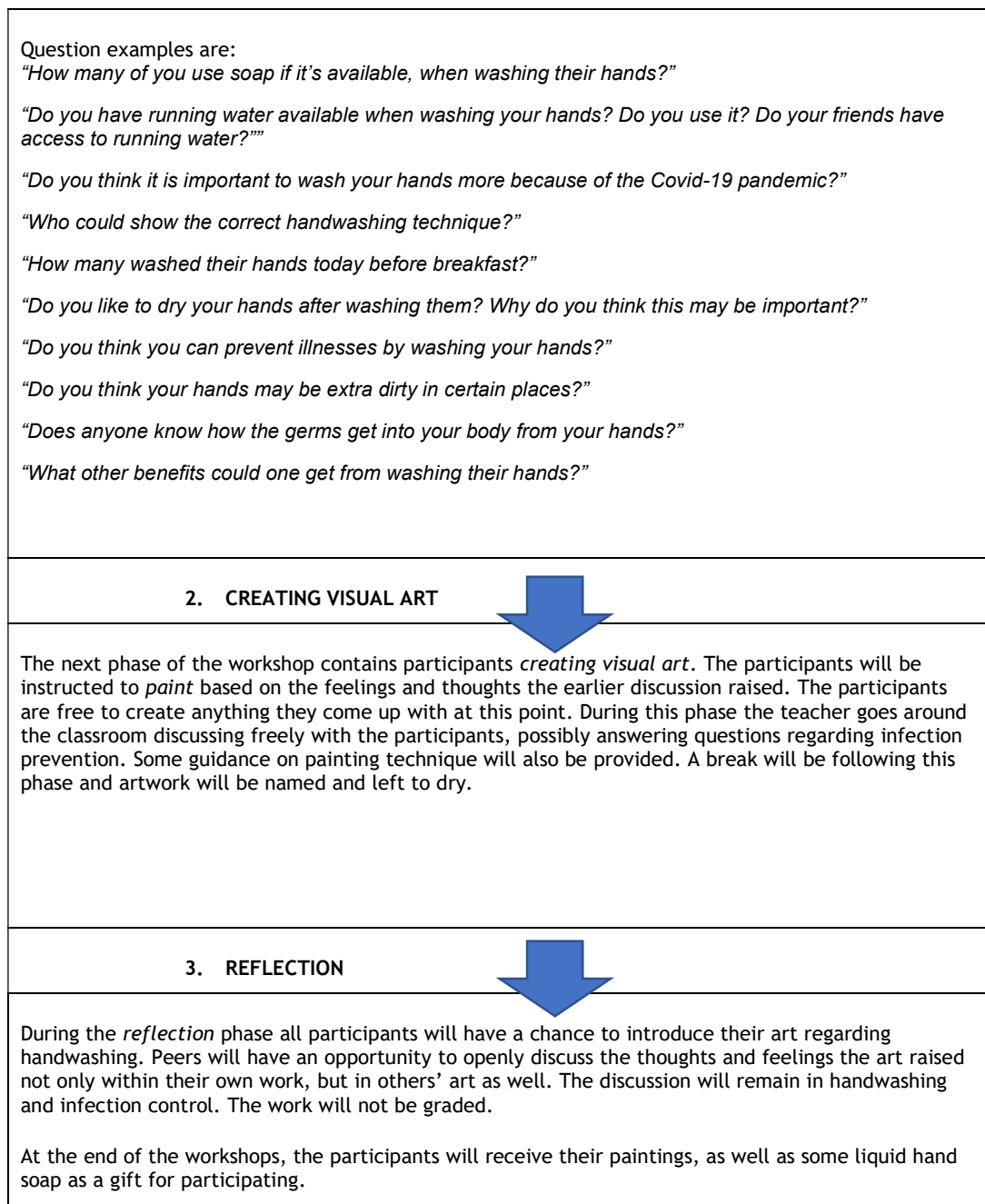


Figure 2: The Paint and Prevent handwashing workshop framework

The ten key items used in the framework were also operationalised into a measurable question battery, presented in the pre- and post-intervention surveys (Appendices 4 and 5.)

4.1.5 Carrying out active experimentation

Carrying out active experimentation was done through piloting the intervention. Piloting can enable direct feedback and correction propositions (Ruckenstein, Suikkanen & Tamminen 2011,96). According to Fancourt (2017, 125), piloting the intended intervention may serve three purposes: road-testing the intervention, allowing stakeholders to see what involvement in the project really requires and help engage them, and finding funding for long-term projects.

The piloting was done in November 2020, with a group of four people in Helsinki, Finland. The group consisted of healthcare professionals, as well as well as people from other fields, aged 25 and above. The intention was to study the easiness of the topics, timing, group size, as well as the selected art method, visual arts, itself. During the pilot workshop, the pre- and post-intervention surveys (Appendices 4 and 5), intended for collecting data to study the outcomes of the intervention, were also tested for validity and readability. Oral feedback was collected from the participants.

The feedback was positive, and although some participant found some topics very easy, they felt these would be appropriate for a younger audience, but also for older participants; even health care professionals attending the pilot study felt they had learned new things. It was also established that the length of the workshop could vary based on how engaged the participants are with the painting.

4.2 Implementing and evaluating the intervention

In the second part, the intervention is carried out, and its outcomes are being evaluated. The intervention is being improved based on the experiences from carrying it out first times.

4.2.1 Reviewing and acting

Reviewing and acting (Fancourt 2017, 134) means learning from the experiences of running the intervention first times and making appropriate changes to it. This also means evaluating the intervention. The workshop outcomes were studied using intervention research (chapter 5).

Due to the ongoing Covid-19 pandemic, the authors were not able to travel to Tanzania for the workshops and data collection. Instead, two Art in Tanzania staff members and one trainee were familiarised with the framework and data collection via a communication software Skype in March 2021. This included discussing the framework step by step, explaining the content of the participant information sheet, as well as methods for data collection. The first discussion with Art in Tanzania staff also included information on facilities, available materials, and financing. A WhatsApp chat group was created for real-

time communication between all stakeholders in Finland and Tanzania. The issue of group size was also brought up.

The workshops were held as a handwashing campaign 6 times in March and April 2021 in Dar Es Salaam, Tanzania. The data were collected from 4 of them. An intern at Art in Tanzania joined the regular staff for the workshops.

4.2.2 Reconnecting

The final step, reconnecting, happens after delivering and evaluating of the intervention (Fancourt 2017, 140). This means returning back to it, altering things that need to be changed, mapping the possibilities to expand, and being innovative: even if the intervention is not yet perfect, one should strive for improvement and further development of the intervention.

The original workshop framework was redesigned after the handwashing campaign in Tanzania. The appearance was made clearer, and the content was edited shorter and more adaptable. Reconnecting with the partner organisation, as well as mapping the possibilities to expand the concept and share the framework will happen after the release of this report: Art in Tanzania will be given the finalised framework handbook, and the results of the study will be published on Global Window platform.

5 Methods

This study was carried out as an intervention study, also known as quasi-experimental study. In literature, several ways to define and classify different levels of experimental, or intervention research exist.

5.1 Intervention study and quasi-experimental study designs

Fancourt (2017, 220) divides the quantitative strategies to pre-, quasi-, and true experimental designs, in which pre-experimental study design involves no control group, but one single group is being studied before and after intervention. Gray, Grove and Sutherland (2017, 241) describe quasi-experimental designs as having three different categories: studies that lack researcher-controlled manipulation of the independent variable, studies that lack the traditional type of control group, and studies that lack random assignment to groups. Pre-experimental studies fall into the middle category and are essentially a type of quasi-experimental study (Gray & al. 2017, 238-240). Melnyk and Morrison-Beedy (2012, 46-47) also group the pre-experimental study design with other types of quasi-experimental studies. They explain that three types exist: a quasi-experimental study that lack random assignment, or

comparison/control group, a quasi-experimental time series design, and pre-experimental designs. These types are not as strong as true experimental ones, but are sometimes used for practical, ethical, or feasibility reasons. However, it may not be easy to determine if the outcomes are due to the intervention, or some external factors. (Melnyk & Morrison-Beedy 2012, 46-47.)

Intervention research aims to learn which methods work by evaluating the cause and effect relationship of an intervention and its outcomes. Three critical parts define intervention research: *Impact* (whether the study will have influence in the field), *significance* (if the study addresses an important problem or not) and *innovation* (does it employ novel concepts and are the aims original). (Melnyk & Morrison-Beedy 2012, 3.) The impact, significance and innovation of this study are presented in Figure 3:

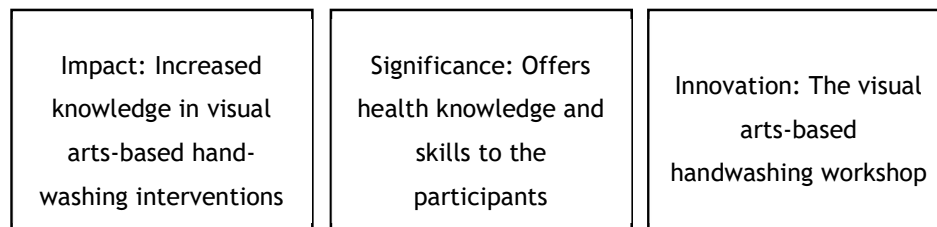


Figure 3: Impact, significance, and innovation of the study

A quasi-experimental pre-test/post-test method was used, and there was no control group. The participants were tested before and after the intervention, and the results compared with each other to determine if there was a significant difference (Figure 4). They filled in pre-intervention surveys, after which they participated in the workshops. The post-intervention surveys were given to the participants right after the workshops. No control group was used. The arrangement to study groups was based on practicality, and all the participants received the same intervention. The results were analysed with the SPSS statistics computer programme.

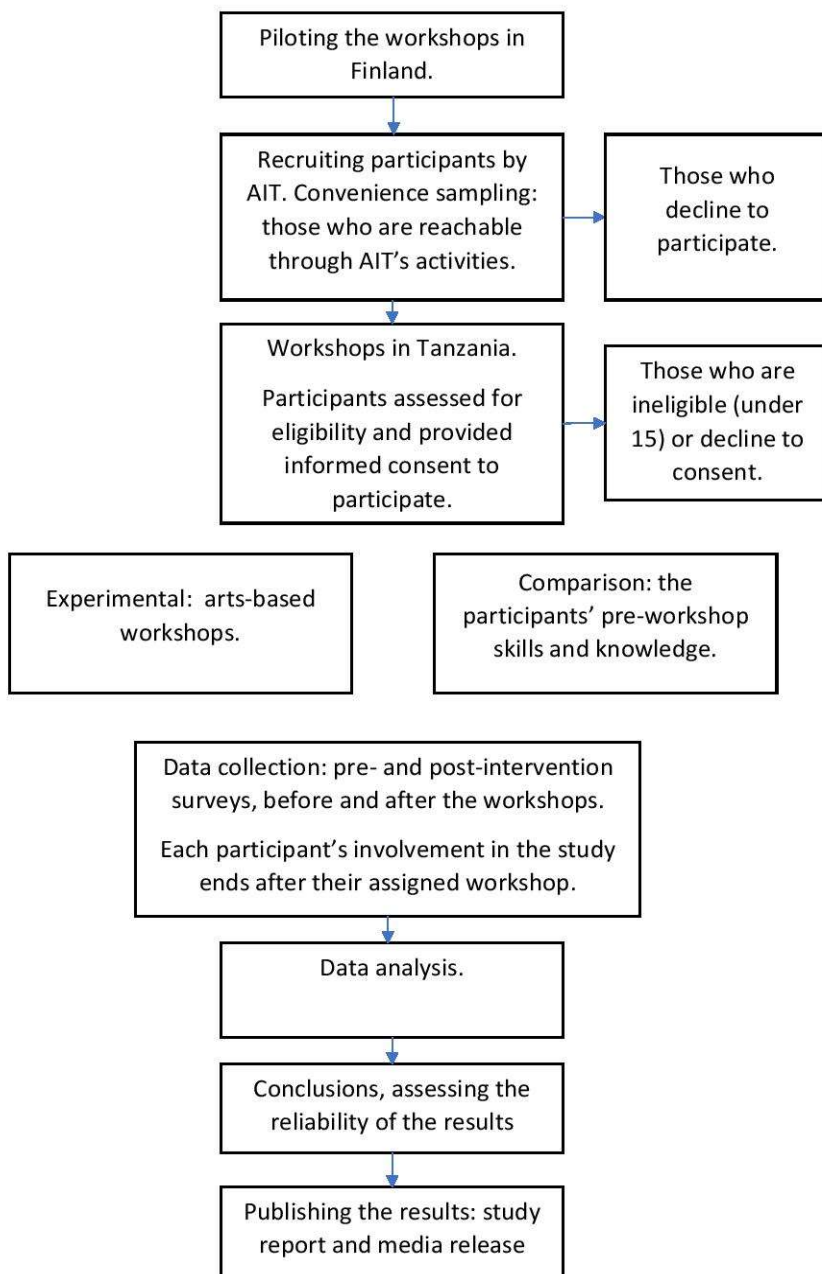


Figure 4: Study description chart (adapted from Fancourt 2017, 245)

5.2 Sampling and recruiting participants

Quasi-experimental studies often employ convenience sampling. This means obtaining enough participants from a local target population, based on availability. The method has its biases, for example if the participants have selected to participate themselves, or there is over or under representation. (Moule 2018, 99.) The sampling technique is also problematic because it is drawn from a certain organisation, and excludes individuals participating in activities by different organisations (Bhattacharjee 2012).

Sampling criteria includes criteria for the target population. A population of a study is the group that is being studied. Through sampling criteria, the target population is found and obtained from the accessible population. Accessible population is the population that is available for the study. (Grove & Ciper 2020, 31-31). In this study, Art in Tanzania oversaw recruitment of participants. The population of the study were Tanzanian adolescents aged between 15 to 17. The target population were those people Art in Tanzania had access to through their usual activities and the final, accessible population were those who attended the workshops. The sampling criteria were *age* (15 to 17), *nationality* (Tanzanian), *language* (English reading skills to understand and answer the survey questions) and *location* (ability to participate in the workshops). An invitation poster was created and used for the recruitment of participants, in which the age and language requirements were mentioned (Appendix 8). A royalty free stock photo by (McCutheon, 2018) was used as a background. Art in Tanzania's staff speak both English and Swahili (Korhonen, 2020b), and helped in carrying out any translation issues during the workshops. Art in Tanzania's staff recruited the participants through their own channels and connections.

5.3 Data collection

Data were collected with two self-constructed pre- and post-intervention surveys (Appendices 4 and 5). The surveys aimed to measure changes in the participants' handwashing skills and knowledge. According to Gray and al. (2017, 363-364) one begins measurement by clarifying what is being measured, for example the object. The measurement can be both direct and indirect: concrete numbers or an abstract idea or concept.

The surveys aimed at measuring the participants' skills and knowledge in handwashing from multiple points of view (Appendix 2). The number of questions was small, to keep the participants interested, and to ease data analysis. The questions were formed in a way which took into consideration the possibility of some participants not having access to handwashing facilities, such as running water and soap. For example, "If I have a place for washing my hands, I wash them before I eat". However, it was not measured if the participants had access to such facilities.

The first section of each survey included three questions (Q1 to 3) about handwashing habits. These questions were classified *under self-reported skills*. The questions aimed to reflect the participants' skills, or how they wash their hands, in everyday life. As the same questions were asked again after the intervention, the intent was to see if their self-reported skills had improved; would the participants feel they may be doing better in handwashing in their everyday life after the workshop.

The next 11 questions (Q4 to 14) were a mixture of *True or False* skill and knowledge claims, each having a correct or incorrect answer. The sum of correct answers was calculated and measured pre- and post-intervention.

The last three questions (Q15 to 17) dealt with the participants' experiences about the workshops and were only collected in the post-intervention surveys. The surveys also asked for each participant's age and gender but giving them was optional.

The Art in Tanzania staff and volunteers collected the data in March and April 2021 from participants of four workshops during a handwashing campaign in Dar Es Salaam. The first half of data was collected from a local orphanage in Dar Es Salaam from two groups. The second half was collected during two workshops held as a part of Art in Tanzania's own activities, and a total of 20 surveys were answered during these workshops. The surveys were anonymous, and the authors could not recognise participants from them.

In total, 114 surveys were returned. In both pre- and post-intervention, 37 fulfilled surveys were included in the data analysis. 20 incomplete or unmatched surveys both pre- and post-intervention were excluded. In 17 of the paired surveys, some answers were either partially answered or had the same questions answered twice. These surveys were accepted into the data analysis.

The filled in surveys were sent for data analysis via WhatsApp messaging application as photos. They were numbered to match the pre- and post-intervention surveys.

5.4 Data analysis

First, descriptive statistics (n, mean = M, standard deviation = SD) were calculated to explore the independent (age and gender) and dependent (participants' pre- and post-intervention handwashing skills and knowledge) variables (Appendix 2). Level of measurement is introduced in table 4. All the data was non-normally distributed, thus making paired samples t-testing unreliable, thus Wilcoxon Signed Testing was used.

Second, self-reported pre- and post- intervention skills were measured with 5-point Likert scale. Summation variable for pre- and post- intervention skill (Q1-3) calculated both separately and by summation variable by mean. Dichotomous True or False variables were

used for measuring skills (n=7) and knowledge (n=4). Of all the variables (n=11) summation variable (Min= 0, Max=11) was constructed to measure both skills and knowledge together (Table 4). Each correct answer was worth 1 point, and each incorrect 0 in the summation of the variables. Dependent variables were transferred to sum variables.

Confirmatory analysis is used for confirming expectations regarding the data expressed as hypotheses, questions, or objectives (Gray & al. 2017, 530). First, the level of measurement is being identified. Next, based on the level of measurement, one chooses the appropriate procedure that will test the hypothesis, respond to the objective, or answer the question. Next, the level of significance is selected, it usually being 0.05. The sample is determined and evaluated. Test tables are run, and in the final analysis, statistical value, the p-value and df (degrees of freedom) are analysed. After ensuring the statistical analyses used were appropriate, one interprets the data in context of the results and the framework. (Gray & al. 2017, 530).

Independent variables	Dependent variables	Sum variables
Age - 15 years old - 16 years old or above (nominal) Gender - Male - Female (nominal)	Self-reported pre- and post-intervention skills (Q1-3) (interval, Likert scale)	Self-reported skills (by mean) (scale)
	Pre- and post-intervention skills (ordinal, dichotomous)	Skills (by sum) (scale)
	Pre- and post-intervention knowledge (ordinal, dichotomous)	Knowledge (by sum) (scale)
	Pre- and post-intervention skills and knowledge (Q4-14) (ordinal, dichotomous)	Skills and knowledge (by sum) (scale)
	Self-reported outcomes (Q15-17) (interval, Likert scale)	Self-reported outcomes (by sum) (scale)

Table 4: Variables

5.4.1 Data analysis techniques

The statistical analyses technique is determined based on the level of measurement used and if the study is studying relationships or differences (e.g. Grove & Ciper 2020, 126). The hypothesis of the study was that the participants' skills and knowledge in handwashing would

increase during the intervention. The null hypothesis was that the participants' skills and knowledge would not increase during the intervention.

Measuring the results of the study was done with the variables list (Appendix 2).

According to Grove and al. (2015, 349), *t*-testing is a way to compare means between two groups. Wilcoxon signed rank test can be an appropriate alternative to *t*-testing. (Grove and CIPHER, 2020, 242). The Wilcoxon signed-ranks test is a nonparametric test for paired samples if *t*-testing criteria are not met in the data. (Grove and CIPHER 2020, 242). It requires ordinal data from two groups, studied as paired samples. (Grove and CIPHER 2020, 126). In the test, If *Z* is less than -1.96 or greater than 1.96, the null hypothesis can be rejected (Statslectures 2020.) The Wilcoxon signed ranks test was used to analyse the difference in the pre-and post-intervention self-reported skills, as well as the True or False questions. Independent samples *t*-testing was used for comparing differences between the independent variables age and gender.

In all analysis, missing cases were excluded case by case. In *t*-tests, an equal variance was assumed. A 95% confidence level, and 0.05 significance were used default. P-value measures the significance of the results, and in SPSS it is displayed as "*sig.*", either one- or 2-tailed. Statistically significant p-value is typically less than 0.05. (Gray & al. 2017, 530). The tailedness of significance means differences in what the study is focusing on: 2-tailed significance means extreme cases in data may occur in either end of the curve (nondirectional hypothesis), and one-tailed significance means extreme statistical values occur in one end of the curve (directional hypotheses). (Grove & al. 2015, 327.)

5.4.2 Characteristics of the participants

The valid sample, (N=37) included paired surveys from participants from 15 and above years old (Table 5). 2 participants did not give their age. Nearly half were 15 years old. The age of participants was further classified as (1) 15 and (2) 16 or over. This was done to create two equally sized groups to use in data analysis.

Age group	Frequency	Valid percent (%)
15	17	48.6
16	6	17.1
17	7	20.0
18 or above	5	14.3
Missing	2	
Total	37	100%
Classified age	Frequency	Valid percent (%)
15	17	48.6
16 or above	18	51.4
Missing	2	
Total	37	100%
Gender	Frequency	Valid percent (%)
Male	22	61.1
Female	14	28.9
Missing	1	
Total	37	100%

Table 5: Participant characteristics

The participants of this study had an opportunity to inform the authors on their gender and age. This information was used for descriptive data analysis. Overall, out of 37 participants there were slightly more male participants compared to female participants. One participant did not inform their gender, for an unknown reason. Participants were further classified into two groups, 15-year-olds being a small minority compared to the participants aged 16 and above. These two age groups were used in the data analysis. Two participants did not inform authors their age, for an unknown reason.

6 Results

In this chapter, the results of the study will be discussed, and analysed in four categories, following the format of the questionnaires: self-reported skills, skills, knowledge, and self-reported outcomes. The intervention and the workshop framework are also looked into.

6.1 Self-reported skills

The participants of the Paint and Prevent handwashing workshops self-reported their handwashing skills slightly better after the intervention. These were measured with questions that highlight how they wash hands. The questions covered using soap, using running water, and washing hands before eating, and each of the questions got better results from the participants afterwards (Table 6). However, there was no significant difference in the self-reported skills pre- and post-intervention. At least one participant had, in fact, reported that their habit of washing hands before they eat, was worse post-intervention than pre-intervention.

Question	Pre-intervention n=number of respondents Mean (M) Min - Max	Post-intervention n=number of respondents Mean (M) Min - Max
Q1: Self-reported skills If I have a place for washing my hands, I wash them before I eat	n=34 M = 1.62 (SD 0.82) Min = 1 - Max = 4	n=36 M = 1.31 (SD 0.79) Min = 1 Max = 5
Q2: Self-reported skills If I have soap, I use it when I wash my hands	n=34 M = 1.74 (SD 0.80) Min = 1 Max = 4	n=36 M = 1.61 (SD 0.80) Min = 1 Max =
Q3: If I have access to running water, I use it when washing my hands	n= 34 M = 1.68 (SD 0.84) Min = 1 Max = 4	n= 36 M = 1.50 (0.81) Min = 1 Max = 4

Table 6: Self-reported skills

According to the pre-self-reported skills outcomes participants (Table 7) had some understanding on handwashing even though they answered were better after the workshop in the post-intervention-survey. Two participants did not answer the pre-self-reported skills survey questions and one participant left the post survey unanswered for an unknown reason.

The participants' reported their pre-intervention handwashing skills good (M 1.68 SD 0.62) They reported their skills having improved post-intervention (M 1.47, SD 0.65) post-

intervention. By Wilcoxon Signed Ranks Test, increase was not statistically significant, at the $p = 0.83$ and the $Z = -1.73$.

The mean for question 1 *“If I have a place for washing my hands, I wash them before I eat”* was 1.62 pre- and 1.31 post-intervention. Although the results improved, the maximum answer was 5 in the post-intervention survey, meaning that at least one person estimated their skills worse post-intervention (Table 8).

The mean answer to question 2 *“If I have soap, I use it when I wash my hands”* was 1.74 pre-intervention, and 1.61 post-intervention. This signals improvement in the self-reported skills in using soap. The maximum score also showed improvement in the results post-intervention.

The mean answer to question 3 *“If I have access to running water, I use it when washing my hands”* was 1.68 pre-, and 1.50 post-intervention. This indicates an improvement in the self-reported skills in using running water. There was a slight decrease in the mean of each pre- and post-intervention self-reported skills question, meaning more participants had rated their skills closer to “Every time” post-intervention.

There were no significant differences between genders or age groups in the results of the self-reported handwashing skills.

	Mean value for self-reported pre-intervention skills (Q1-Q3)	Mean value for self-reported post-intervention skills (Q1-Q3)
N valid	34	36
N missing	3	1
Mean	1.68	1.47
Median (MD)	1.67	1.00
Std. Deviation	0.62	0.65

Table 7: Mean values for pre- and post-intervention self-reported skills

6.2 True or False

The 11 True and False questions were analysed separating the skills and knowledge questions, as well as together (Table 8).

Variable	Pre-intervention n=number of respondents Mean (M) Standard Deviation (SD) Min - Max	Post-intervention n=number of respondents Mean (M) Standard Deviation (SD) Min - Max
Skills (n=7)	n=37 M = 3.86 (SD 1.30) Min = 1 Max = 6	n=37 M = 4.41 (SD 1.07) Min = 2 Max = 6
Knowledge (n=4)	n=37 M = 3.11 (SD 0.84) Min = 1 Max = 4	n=37 M = 3.32 (SD 0.71) Min = 2 Max = 4
Skills and knowledge (n=11)	n=37 M = 6.97 (SD 1.40) Min = 4 Max = 10	n=37 M = 7.73 (SD 1.39) Min = 4 Max = 10

Table 8: True or False statistics

6.2.1 Skills

An independent samples *t*-test showed no statistically significant differences between genders or age groups in the results of pre-and post-intervention skills questions. On average the respondents reported their skills better pre-intervention, $M = 3.86$ ($SD = 1.30$), than post-intervention, $M = 4.41$ ($SD = 1.07$). The Wilcoxon signed ranks test showed that most of the participants ($n = 17$) ranked better in their post-intervention answers. The difference was statistically significant ($p = 0.034$, $Z = -2.214$).

There was an increase in every gender and age group's average amount of correct answers in skills questions pre-intervention.

6.2.2 Knowledge

The Wilcoxon signed ranks test showed no significant difference in the increase of correct answers in the knowledge questions. Only 10 participants scored better pre-intervention, whilst 20 participants had the same number of correct answers. Male participants got slightly less correct knowledge answers post-intervention. Female participants' results improved. The post-intervention knowledge of 15-years-old was slightly worse than pre-intervention. For 16-years older or above, there was an improvement in the results.

The Wilcoxon signed ranks test showed no statistically significant difference in pre- and post-intervention-handwashing knowledge ($p= 0.149$, $Z= -1.442$). Ten participants improved their handwashing knowledge. Male participants had less correct knowledge answers post-intervention. Female participants' results improved after the intervention. The post-intervention knowledge of 15-years-old was slightly worse than pre-intervention. For 16-years older or above, there was an improvement in the results.

6.2.3 Skills and knowledge

A total of 23 participants got more correct answers in all the True or False questions post-intervention. For 7 participants, the results got worse, and for 7 participants, the amount of correct answers stayed the same. There was a significant difference in the number of correct answers ($p\text{-value} = 0.02$ $Z= -2.330$).

The sum of correct answers pre-intervention ($M= 6.97$, $SD 1.40$) increased post-intervention ($M 7.73$, $SD 1.39$). No one got all 11 questions right: the minimum amount of correct answers was 4 and maximum was 10 both pre- and post-intervention. The histograms below (Figures 5 and 6) show that there were less participants scoring only 4 or 5, and more participants scoring 10 post-intervention.

The Wilcoxon signed ranks test shows a significant ($p= 0.02$, $Z= -2.330$) improvement in the overall dichotomous True or False questions.

Both gender groups scored better in the post-intervention True or False questions. Both age groups also scored better in the post-intervention True or False questions.

6.3 Self-reported outcomes

Participants' self-reported experiences in the outcomes of the intervention got a very good response (Table 9). The majority strongly agreed or agreed (M 1.03, SD 0.17) that their skills and knowledge in handwashing had improved during the workshop, and that they had learned new things about how handwashing can improve their health (M 1.11, SD 0.17). The participants also reported it easier to learn about handwashing because of the painting (M 1, SD 0.32). All in all, the mean sum for the self-reported outcomes was 3.22. The most typical sum for overall self-reported outcomes was 3. One responded only gave 2 points, which is likely due to not answering one question.

Question	Pre-intervention n=number of respondents Mean (M) Standard Deviation (SD) Min - Max
Q1: My skills and knowledge in handwashing have improved today	n=36 M =1.03 (SD 0.17) Min = 1 Max = 2
Q2: I have learned new things about how handwashing can improve my health today.	n=36 M = 1.11 (SD 0.32) Min = 1 Max = 2
Q3: It was easier to learn about handwashing because we painted, too.	n=36 M =1.00 (SD 0.32) Min = 1 Max =2
Sum of self-reported outcomes	n=36 M =3.22 (SD0.68) Min = 2 Max =6

Table 9: Self-reported outcomes

The participants reported the intervention having been helpful in increasing their skills and knowledge and in learning new things, and that painting helped them learn new things. They mostly strongly agreed that their handwashing skills and knowledge had increased, that they had learned new things about how handwashing can improve their health, and that it had been easier to learn about handwashing because of the painting. The study shows a varying level of increase in both handwashing skills, and handwashing knowledge of the participants. Female participants gave a significantly higher score for their self-reported outcomes in general, than male participants.

In pre-intervention self-reported skills there were no significant differences between gender or age groups. Reporting skill outcomes after reflecting on the pre- and post-intervention surveys, authors can come to see that all gender and age groups' scores had improved without a significant variation between the two. On the other hand, between the knowledge pre- and post-surveys men answered slightly worse than women. 15-year-olds answered slightly lower than 16 and above between the pre- and post-knowledge surveys, without a significant difference. Saying this both age groups improved their answers comparison to the pre-survey.

6.4 The intervention and workshop framework

This study aimed at creating a visual arts-based infection prevention intervention, as to increase participants' skills and knowledge in handwashing. The intervention was successfully carried out in March and April 2021, and based on the data analysis, it did increase its participants' skills and knowledge in handwashing. The framework, which the intervention was based on, was created before the intervention, and tested through piloting and collecting feedback from the staff of Art in Tanzania.

The framework itself had three parts, discussion, painting, and exhibition (Appendix 9). In the discussion part, examples of questions are given to start discussion on the topics. The handbook also describes how one can start the discussion, and how to move on to new topics. These points were added to make the framework flexible and useable.

The hypothesis of the study, that the participants' skills and knowledge in handwashing would increase post-intervention, was proven true.

7 Discussion

This study aimed at increasing the participants' handwashing skills and knowledge, and in the light of the data analysis, it did succeed in that. The objectives included studying the participants pre- and post-intervention skills and knowledge in handwashing. This goal was met in the statistical data analysis. More specifically, participant's knowledge and skills in handwashing improved in all the four data-separation areas. The objective of creating an infection prevention intervention was met, as well as creating a tested framework to share with Art in Tanzania.

The hypothesis was simple and seemed obvious: such intervention would increase the participants' skills and knowledge in handwashing. Fancourt (2017, 191) notes that focusing on such "common-sense" phenomena may help in bringing up new ideas and aspects.

7.1 Reliability and validity

The framework was created using Daisy Fancourt's model (2017). The authors had no previous experience in creating an arts-based health intervention, thus following the model made the process easier and more reliable. The initial workshop framework was created between the two authors. Although it followed Fancourt's model, the intention was to create something original. A handbook based on the framework was written to help in using the framework. The first edition of the handbook was given to Art in Tanzania staff before the workshops, and a new version was created after the workshops based on the feedback, and data analysis. Although the content did not change much, additions were done to the final version: notes that one should check the timeliness of information, as well as encouragement to try other art forms were added. The staff of Art in Tanzania performed the workshops for this study in two different locations. All workshops were held outside in open air, but in an area that provided handwashing facilities to demonstrate and practice accurate handwashing performance.

Internal validation was strengthened by understanding the relation between the independent and dependent variable (Grove & al. 2015, 225-227). Authors did not know beforehand the ages, sexes, or the distribution of these two independent variables between the participant groups attending the workshop. Interventional quasi-experimental studies often have this feature. The study designs nature lacks random assignment groups. According to Grove and al. (2015, 213) research bias has been avoided by not manipulating the variables of the study, this can be ensured by four steps, conceptualizing and operationalizing, sample selection and size, valid and reliable instruments and data collection procedures (Grove & al. 2015, 213).

A larger pilot group, closer to the intervention participants' age, could have been used, since participants in the pilot were all over their mid-twenties. Pilot groups could have been conducted with elementary and high school children comparing their piloting test results and concluding which age range would benefit from the intervention more. There is also a cultural aspect: pilot study participants in Finland may have a better health education curriculum and handwashing faculties in comparison to Tanzanian children.

There were two authors in this study for increasing the interrater reliability and decreasing the possibility of error in research (Grove & al. 2015, 289-290). To avoid research error survey answers were analysed in two different occasions with both authors cross-checking the data. As what comes to reliability of intervention implementation authors and workshop holders assure that the intervention was carried through consistently according to a standardized framework of this study to avoid inconsistency and statistical errors (Grove & al. 2015, 226).

7.2 Evaluating methodology

A measurement error is always present (Gray & al. 2017, 364), for example the measurement only captures part of the concept. Reliability (the consistency of the measures), and validity (how well it reflects the construct being studied), also need to be considered (Gray & al. 2017, 370, 375). The validity and reliability of the surveys were assessed through piloting. The surveys were piloted in Finland in November 2020. The participants of the pilot study were asked to look at the questions and content of the workshops and surveys from multiple points of view, such as readability and length of the surveys. The piloting group found the surveys easy to read and understand, although they mentioned some of the questions being “tricky”: for example, question 9 states the order of handwashing, and if read carelessly, the statement might seem correct. However, the participants of the pilot study evaluated such a question to be suitable for the intended age group. They found the questions were valid and related well to the topic of the workshop. The participants also found the pre-and post-intervention surveys easy to read, and short enough. After the pilot study, open-ended questions were removed from the surveys to simplify data analysis, and the number of dichotomous questions were further increased. Overall, the pilot group evaluated the surveys having a good face validity (Gray & al. 2017, 376).

In the future, the measurement tool, the survey, could be studied further. This time, the authors created it themselves, and it was not tested on a pilot group matching the study participants’ demographic. The questions were not tested using statistical tools. It also lacks the benefit of repetitive usage.

When comparing the sum variables or using other data analysis techniques, such as the Wilcoxon signed-ranks test, attention had to be paid to the backwards nature of the original ranks: typically, in Likert scale questions, the lowest number is used to describe the “worst” answer, and the highest number describes the “best” answer (Kerlinger & Lee, 2000 in Ciper & al. 2015; Nunnally & Bernstein, 1994 in Ciper & al. 2015). As a default, categorical analysis techniques give results based on the typical scale formatting. In this data analysis, the data was originally coded from 1 to 5, 1 being the “best” answer”, and 5 “the worst”. The form was kept as the authors felt it would have been confusing to change it in the middle of data analysis but do note it did later make the analysis challenging.

7.3 Outcomes

The small improvement in the overall mean of the self-reported skills could have been due to the intervention. The participants may have felt that they will, in the future, have better handwashing habits, or skills, and the intervention helped them to pay attention to them. However, as the improvement was not significant, it could have been due to participants haphazardly answering to the questions.

As most participants ranked higher in the post-intervention True or False questions, the intervention likely had a positive impact on them, and increased their skills in handwashing.

The dichotomous survey questions were divided into seven skill and four knowledge questions. For clarity it might have been beneficial to have an even number of questions to avoid an imbalance of data. The skill data points to a significant increase of more correct answers in the post-survey, compared to the pre-survey, unlike between the knowledge questions where there was no significant, although some, increase of correct answers. After summing up all the dichotomous skills and knowledge survey questions authors concluded a statistically significant rise in the correct answers reflecting the pre- and post-survey outcomes. In some cases, the answer got worse or remained the same. None of the participants scored a full score out of the dichotomous questions in the survey.

The participants not ranking significantly higher in the post-intervention survey knowledge questions may be due to several reasons: one reason to look at is the small number of questions concerning knowledge. The results might have been more reliable and significant if the knowledge questions equalled the number of skills questions. It is shown in the next phase of the data analysis, that once inspected together, the skills and knowledge of the participants improved post-intervention.

According to the self-reported outcomes, most of the participants strongly agreed their skills and knowledge in handwashing increased and they had learned new things during the arts-based workshop they attended to. Authors came across a small conflict between the reported self-reported outcomes and knowledge outcomes of this study, since participants had the feeling that their knowledge had risen after the workshop, even though there was no significant rise between the dichotomous knowledge outcomes while comparing the before and after survey. All participants strongly agreed that conducting art made it easier to learn on handwashing. Only one participant left the self-reported outcome questions unanswered for an unknown reason.

The self-reported outcomes varied between age and gender groups. This may be a result of many reasons: was one of the workshops performed differently from others and were there more male participants attending that day?

The results were promising but conducting such a small study may not show the true impact of the type of intervention used. The long-term results will also remain hidden unless a follow-up study is carried out. The study should perhaps be carried out several times or study the same groups of participants again to see the long-term effects.

7.4 Ethical and legal consideration

This study adheres to the guidelines of Ethical Principles of Research with Human Participants and Ethical Review in The Human Sciences in Finland, published by TENK in 2019. The guidelines “cover all scientific research that involves human participants or research methods used in human sciences” including fields such as arts, technology, natural science, medicine, and non-invasive health (TENK 2019, 50).

As a part of good scientific practice, a good plan for communication and publication were prepared early in the research process. Planning can only prevent confusion regarding authorship and finding ways to communicate the results in a way that stands out from other research publications. (Ala-Nikkola & Rekola 2020.) A written team agreement was signed by all study parties, including Art in Tanzania, authors, and the research supervisor (Appendix 6). In this agreement the responsibilities, communication, and publication of the work between the project partners were explained. Art in Tanzania’s responsibilities were recruiting participants, faculties and equipment for the workshop as well as making sure legal and ethical permits were on point from the Tanzanian point of view. The authors oversaw conducting the framework for workshops, as well as passing the knowledge on to Art in Tanzania staff through the provided material, who then held the workshop. Workshop material costs were split between the authors.

Unfortunately, the authors were unable to travel to Tanzania as originally planned during the Covid-19 pandemic, therefore a new plan had to be taken into consideration where the authors familiarised the Art in Tanzania staff to hold the workshops in Tanzania on behalf of the authors. It was agreed upon all, that participation forms would be send to the authors via WhatsApp messaging application. According to Korhonen (2020a), there was no need to translate the participation information sheet and consent form English to Swahili, as Tanzania’s official language is English. The authors had no previous connection to the participants, while Art in Tanzania staff may have been familiar with some of the adolescents participating in the workshops.

This study included participation of minors aged between 15 and above. According to TENK-guidelines, the research survey had to be explained to minors in a manner that they were able to understand. All participants needed to give their own consent for participation in the research. (TENK 2019, 53.) Participants were able to discontinue the research participation, as well as ask for further information concerning the research, at any time. Information regarding discontinuing the research was available on both the research form and participation sheet. Participation in the research should not harm the participant in any form or way (TENK 2019, 50-51). According to the guidelines put forward by TENK (2019, 50), “The

researcher respects the dignity and autonomy of human research participants. The rights laid down in the Finnish Constitution (1999/731, section 6-23) are held by everybody”.

The authors aimed for a broader age group between the ages 13 to 17. Due to logistical reasons working from Finland, as well as language barriers between nations, it would have been hard to supervise correct parental permissions and provide information on the research from adolescents under the age of 15, which is the age recommendation for parental consent by the TENK ethical guide lining (TENK 2019, 53). Art in Tanzania would have been happy to include younger participants but also understood the conflict of age and parental permission, for this reason adolescents between 13 to 14 were ruled out of the research. According to the feedback and learning experiences of the participants in the pilot of this study, it was concluded that handwashing interventions may be needed between older adolescents and young adults as well. Pilot study was held for four young adults between the age 25-35 from various fields of work.

The Human Sciences Ethics Committee of the Universities of Applied Sciences in the Helsinki Metropolitan Area found no need for an ethical review since the research dealt with minors over the age of 15, as well as the fact that no personal information was collected throughout the research. The ethical committee advised the authors not to submit a personal data register, since it is not needed in this study. Instead, they were advised to simply notify adolescents beforehand on the nature of the workshop and explain the participation in the survey. (Gröhn 2020). Authors had also contacted Mr. Willibrod, the ambassador of Nordic countries and Ukraine, to ensure we had all needed permits from Tanzania. Willibrod (2020) advised the collaboration partner Art in Tanzania to make an enquiry to COSTECH to see, if any additional permits were needed regarding this study. According to Korhonen (2020a) as a Tanzania-based organisation, which already had the government’s permission to operate with adolescents, Art in Tanzania did not need a separate permission to participate in or carry out interventions such as in this study.

According to Responsible Research (2018) a research publication’s audience is not the scientific community alone. Besides the academic world, researchers need to be able to communicate the research aims and objectives as well as the methodology, data analyses and research results in a clear way to several different audiences, for example to research participants, collaborators and other possible sponsors funding the research. The faculty supervisor of the applied sciences institute has been responsible for familiarising students with an ethical understanding and a guideline for research integrity. Researchers are held accountable for understanding ethical principles and responsibilities of practice, signs of violation, RCR guidelines and the consequences of fraud, as well as understanding the steps and procedures of ethical evaluation. Expertise knowledge was needed in data protection, the handling of sensitive information as well as the creating of thesis agreements throughout

the research. (ARENE 2018, 4.) According to good research practice it is important to follow material, method, result and publication guidelines while conducting any research, researchers should follow the copyright act and always give recognition accordingly, while referring to the origin, thus respecting the copyright legislation. (ARENE 2018, 10.)

The open science and research model RDI aims at creating openness and transparency throughout different fields of scientific research. According to ARENE (2018, 9) “The goal is to improve openness, quality, reliability, and visibility in RDI activities and to promote the societal effectiveness of the projects and the emergence of new innovations”. Throughout this study, ARENE guidelines regarding materials, methods, results, and outcomes in relation to the open science and research model have been followed. (ARENE 2018,9.)

General data Protection Regulation, or GDPR, (Art. 4(1)) defines personal data as “any information relating to an identified or identifiable person”. This information could be such as a name, an identification number, location, or online identifier. It could also be specific information on a data subject’s physical, physiological, genetic, mental, economic, cultural, or social identity. (European Union 2016.) No personal information was collected through this research. Participants’ age and gender were asked for in the surveys, but giving them was voluntary, and the information could not be connected to individual participants. Participants surveys were destroyed by an Art in Tanzania employee, soon after the workshops by burning the surveys.

The authors did not participate in the data collection in Tanzania, and had no evidence if participants had the possibility to decline from the research or if the participants really were between the agreed age range. There is a small likelihood of a reliability participant error that answers were given to participants while filling the before and after surveys or participants not fully understanding all the questions in the before - and after survey. However, the authors had a trustworthy relationship and good communication with Art in Tanzania in the belief that workshop holders worked ethically and aligned on what had been agreed upon.

The study results will be published on the Global Window platform at Laurea University of Applied Sciences, as well as on Theseus. The main publication will be the project report. The content of the publication includes reporting the creation, testing, and studying of a visual arts-based workshops aimed at increasing the participants’ skills and knowledge in handwashing. The target group for the publication are other students at Laurea University of Applied Sciences, the staff at Art in Tanzania, the collaborator partner of the study, and the scientific community in health education. The authors have the copyright to the content of the workshop framework, as well as the data and reporting of the study.

The project was financed by the authors.

8 Conclusions

This study investigated the outcomes of a visual arts-based handwashing workshop. The workshops were carried out six times in spring 2021 in Dar Es Salaam and consisted of workshops created by the authors. It also investigated the participants' skills and knowledge in handwashing pre- and post-intervention, using a quasi-experimental intervention study design. Melnyk & Morrison-Beedy (2012, 3) state that the impact, significance, and innovation are all parts of intervention study, and help in figuring out which interventions works, and which ones do not. The impact of this study are the study results that will offer increased knowledge in visual arts-based handwashing interventions to be used in the field of health education and infection prevention. The product of the study, a framework for a visual arts-based handwashing campaign will help future health educators with a tested way to teach their audience handwashing skills and knowledge, making it innovative. This study also shows that the participants of the initial workshops did indeed have increased skills and knowledge in handwashing after the intervention, making it significant in a way it was intended to be.

This study focused on an arts in health intervention. The results of this study showed some increase in both skills and knowledge of the participants, but not perhaps as much as the authors had assumed and hoped for. This may be due to many reasons, but can also help in raising a question: what could be done differently next time? Was it the intervention, or the study method that should have been different? Furthermore, was the intervention culturally appropriate? Bunn and al. state (2020) this may be an issue, as well as inequality between participants and researchers. Cultural issues were mostly eliminated by logistics: the authors could not travel to Tanzania, and thus the workshops were run by local coordinators. The Art in Tanzania staff had the freedom to run the workshops the way they saw the best, without interference from the authors. The content of the workshops covered current issues such as Covid-19 pandemic. It is unclear to the authors how thoroughly this topic was covered during the workshops. Bunn and al (2020) also mention that sometimes quantitative study methods may show unjustified positive results of arts in health interventions. The authors were not previously familiar with data analysis techniques used in this study but acknowledge the possibility of bias in interpreting the results. This may also have led to a type I error in data analysis: the null hypothesis may have been rejected even though the study result were not in real life very significant. (Grove & al. 2015, 328-329).

Ethically, the authors had no evidence if participants had the possibility to decline from the research or if the participants really were between the agreed age range. This issue was handled by accepting a broader age group in the final sample. There is a small likelihood of a reliability participant error that answers were given to participants while filling the pre- and post-surveys or participants not fully understanding all the questions. There is no reason to assume such behaviour or other bias behaviour such as changing the answers afterwards,

since the authors had a trustworthy relationship and good communication with Art in Tanzania in the belief that workshop holders worked ethically and aligned on what had been agreed upon.

According to Grove & al. (2015, 83) open ended questions may help a researcher gain new insight on the study as participants are encouraged to raise unaddressed issues and observations the authors themselves might have not noticed. Open end questions could have been a great way to measure the participants self-reported skills and overall experience on the workshop. According to Fancourt (2017, 108-109) participants may feel and experience the overall experience quite differently than expected, therefore the more detailed the feedback of the study is the richer the observation and validity could be. However, authors decided consciously to rule out any qualitative questions due to time and resource restrictions.

The framework and pre- and post-intervention surveys were piloted before introducing them to Art in Tanzania. Conducting a pilot study, it may become clearer on what the study may reach in measurable terms (Fancourt 2015, 121). Piloting can also enable direct feedback on product or service testing, making future development ideas more visible (Ruckenstein & al. 2011,96). In the pilot study, four participants tested the intervention out and gave the authors feedback on the overall experience. The pilot study was used as a measurement tool for reliability of the surveys, making observations on the stability, and measuring methods. (Grove & al. 2015, 289). The observation of age-appropriate tasks was risen, since some of the piloting participants felt the questions on pre- and post-intervention surveys were too easy.

The authors reviewed a large amount of background information for the study and the workshop content to make sure it was accurate and reliable. They concentrated on ten handwashing items: five of skills, and five of knowledge. A table was created to clarify the information to be taught. This was done as to make it easier to follow what should be taught, as well as to later change any of the topics, should it get old or irrelevant. For example, would the COVID-19 issue be a big deal in five years? In the framework, one can easily change any of the topics, and use information that is currently appropriate for their audience. This can also be done to better adjust to participants' age, location, or socioeconomic backgrounds.

Authors decided to rule out participants that had answered only one out two participants surveys. There may be multiple unknown reasons why participants may have not answered questions seriously, circled questions twice or left some questions unanswered completely. One out of many reasons could have been the layout, language, or length of the survey. Another reason could have been lack of concentration or interest in the subject or personal reasons such as lack of sleep or teenage irritation.

Some issues were discussed about the framework during and after the project. The authors left out some handwashing information, that could have been audience appropriate in Tanzania, for example using ash instead of soap. Furthermore, Art in Tanzania addressed that perhaps in the future other methods of art, such as acting could be a part of the workshops, hence not all participants felt gifted in conducting visual arts (Mgaula, 2021) The authors see no conflict in this, as the framework was created to be flexible. Arts-based approaches have been used widely in health promotion in Sub-Saharan countries between indigenous communities, and single and mixed methods of arts such as performing arts, filmography, storytelling, music and dancing were the most common forms of arts used in health education. Throughout history art has been a platform of describing health phenomenon's and changed health behaviour. (Bunn & al. 2020.) Using other art methods could bring new possibilities in using the framework.

After delivering the workshops the authors and the workshop team from Art in Tanzania gathered to have a reflective reconnecting session to discuss and evaluate the overall workshop and its outcomes, discovering future development ideas and innovations. The organization noted that the workshop would serve a greater good, if it could have been performed to children under the age of 13 educating them on handwashing skills. Such collaboration could be possible since Art in Tanzania works actively with younger children as well. In the future the framework conducted could be more age and target group appropriate.

All in all, the team holding the workshops thought that the workshop framework was clear and easy to perform from. As what came to communication between the two parties, Art in Tanzania states that "It was like we were together through the process" even though working in different countries and cultures (Mgalula, 2021). Art in Tanzania states that the framework may very well be used with future exchange students, in-country interns, and volunteers in the future (Korhonen, 2021). Authors are happy to pass on the workshop instrument surveys and the collected data for future further development research.

The authors suggest that in the future the framework outcomes will be tested with other, perhaps qualitative study methods. It is also suggested that in case of quantitative data analysis, the tool used for this study will be revised and changes made to it to make it more measurable and useful: there should only be 10 dichotomous questions, and the first three questions should not be asked again, as this may not add value or information. The data used for this study will be available for research through the authors. They also suggest that the framework is tested with different age groups, and perhaps even different art methods to evaluate its flexibility and useability.

The ongoing COVID-19 pandemic had a huge impact on the schedule and execution of the project. The original plan was to carry out the workshops in January 2021, with both authors

traveling to Tanzania. However, due to restriction by Laurea University of Applied Sciences, this was not supported by the faculty. Unfortunately, Tanzania had to face the untimely death of their past president in March 2021, which even further delayed the beginning of the handwashing campaign in Tanzania. These issues shadowed the study, but were overcome through cooperation, and using online conference and messaging tools.

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Appendix 1: Conceptualisation of key items

Ten key items:	Identifying learning needs:	Transferrable knowledge:
Skills		
1. Soap	Identifying the relevance of soap in handwashing manners.	Soap should be used every time hands are washed, to remove pathogens efficiently.
2. Timing	Identifying when washing your hands is necessary.	The correct handwashing times: Before, during, and after preparing food; before eating food; before and after caring for someone at home who is sick with vomiting or diarrhoea; before and after treating a cut or wound; after using the toilet; after changing diapers or cleaning up a child who has used the toilet; after blowing your nose, coughing, or sneezing; after touching an animal, animal feed, or animal waste; after handling pet food or pet treats, and after touching garbage
3. Drying	Identifying the importance of drying hands regarding infection prevention.	Hands should be dried completely dry with a clean towel after washing your hands, to prevent pathogens from attaching to the skin
4. Technique	Identifying the need to cover each part of your hands, while washing your hands. Identifying the correct order and duration of handwashing.	The correct order for handwashing is: add water, add soap, scrub, rinse, dry. Hands should be scrubbed together 20 seconds after adding soap to remove pathogens efficiently.
5. Running water	Identifying the importance of running water.	Running water is an important part of handwashing for removing pathogens and soap efficiently, also in the reduction of skin irritation from soap. It is also safer than stagnated water. Water does not have to be hot. Cool water may cause less skin irritation and is more environmentally friendly than warmer water
Knowledge		
6. Preventing illness	Identifying that handwashing prevents diarrheal disease and respiratory infection related illness and deaths.	Washing hands regularly prevents respiratory infections and diarrhoeal diseases, common cold, flu and the spread of anti-microbial resistant bacteria.

7. Locating pathogens	Identifying the locations and pathogens living on one's hands.	<p>Most of the microbes on one's hands live under the fingernails.</p> <p>Normal human flora (germs) can be dangerous in wrong places.</p>
8. Routes of transmission	Identifying the most common ways pathogens move from hands to people	Through hands to mouth, nose and ears, as well as surfaces.
9. Global Infection prevention	Identifying the effects of handwashing in a global health aspect.	<p>Handwashing is one of the most effective preventative method regarding infection control, and during the Covid-19 pandemic handwashing should be even more regular.</p> <p>Prevents antibiotic resistant pathogens.</p>
10. Accessibility	Identifying global issues with running water and lack of soap.	<p>40% of the world's population live in areas where water and soap are inaccessible.</p> <p>Only 19% of adolescents in Tanzania wash their hands after using toilet.</p>

Appendix 2: Operationalisation of the pre- and post-intervention surveys and variables

Pre- and Post-intervention survey and variables table (Sections 1 and 2 are identical in both surveys)					
Age: 1= 15, 2=16, 3=17					
Gender: 1= MALE 2=FEMALE					
Section 1: Skills (current habits vs. future habits/ a promise of / a change in attitude)					
Likert scale: 1= Every time 2= Almost every time 3 = Sometimes 4= Almost never 5 = Never					
1.If I have a place for washing my hands, I wash them before I eat	1 Every time	2 Almost every time	3 Sometimes	4 Almost never	5 Never
2.If I have soap, I use it when I wash my hands	1 Every time	2 Almost every time	3 Sometimes	4 Almost never	5 Never
3.If I have access to running water, I use it when washing my hands	1 Every time	2 Almost every time	3 Sometimes	4 Almost never	5 Never
Section 2: Skills and knowledge: True or false (Amount of correct answers before and after intervention)					
1= CORRECT 0=INNOCORRECT				Reference	
4. Knowledge: Touching your face with dirty hands may spread germs to your nose, mouth or eyes	1 True	0 False	CDC 2020a		
5.Skill: You should always use hot water for washing your hands	0 True	1 False	Carrico & al, 2012; CDC 2020c		
6.Skill: You should dry your hands with a clean towel after washing them	1 True	0 False	Todd & al. 2010;CDC 2020c		

7. Skill: You should always rub your hands together at least 30 seconds after adding soap when washing them	0 True	1 False	NHS 2019; CDC 2020c		
8. Skill: You should always wash your hands after changing a baby's diaper	1 True	0 False	CDC 2020a		
9. Knowledge: Respiratory infections and diarrhoeal diseases cannot be prevented by proper handwashing	0 True	1 False	Duodecimlehti 2012; Burton et al. 2011; UNICEF & WHO 2020		
10. Skill: The correct order to wash your hands is: Add soap, add water, rinse, scrub, dry with a clean towel	2 True	1 False	WHO 2019; CDC 2020a;		
11.Skill: You should always use soap for washing your hands	1 True	2 False	Burton et al. 2011;		
12. Knowledge: 40% of the world's population live in areas where water and soap are inaccessible	1 True	2 False	UNICEF & WHO 2020		
13. Skill: Using water in a water basin for washing your hands is just as good as using running water	2 True	1 False	Palit et al. 2012; CDC 2020c		
14. Knowledge: During the Covid-19 pandemic, it is important to wash your hands even more frequently	1 True	2 False	CDC 2020d		
Section 3: Feedback and self-reported outcomes of the workshops (only in the post survey)					
Likert scale 1 = Strongly agree 2 = Somewhat agree 3 = Do not agree or disagree 4 = Somewhat disagree 5 = Strongly disagree					
15.My skills and knowledge in handwashing have improved today.	1 Strongly agree	2 Somewhat agree	3 Do not agree or disagree	4 Somewhat disagree	5 Strongly disagree

16.I have learned new things about how handwashing can improve my health today.	1 Strongly agree	2 Somewhat agree	3 Do not agree or disagree	4 Somewhat disagree	5 Strongly disagree
17.It was easier to learn about handwashing because we painted, too.	1 Strongly agree	2 Somewhat agree	3 Do not agree or disagree	4 Somewhat disagree	5 Strongly disagree

Appendix 3: Pre-intervention survey



Welcome to our Paint and Prevent handwashing workshop. This survey is not a test, and your knowledge will not be compared to the knowledge of the others'. If you have any questions, please do not hesitate to ask.

DO NOT WRITE YOUR NAME ON THIS PAPER.

After this survey, we will have some fun!

Age (optional):

Gender (optional):

Please answer the following questions. Circle the answer that fits you the best.

- | | | | | | |
|---|------------|-------------------|-----------|--------------|-------|
| 1. <i>If I have a place for washing my hands, I wash them before I eat.</i> | Every time | Almost every time | Sometimes | Almost never | Never |
| 2. <i>If I have soap, I use it when I wash my hands.</i> | Every time | Almost every time | Sometimes | Almost never | Never |
| 3. <i>If I have access to running water, I use it for washing my hands.</i> | Every time | Almost every time | Sometimes | Almost never | Never |

Please answer the following questions. Circle what you think is the correct answer (True) or (False).

- | | | |
|--|------|-------|
| 4. <i>Touching your face with dirty hands may spread germs to your nose, mouth or eyes.</i> | True | False |
| 5. <i>You should always use hot water for washing your hands.</i> | True | False |
| 6. <i>You should dry your hands with a clean towel after washing them.</i> | True | False |
| 7. <i>You should always rub your hands together at least 30 seconds when washing them.</i> | True | False |
| 8. <i>You should always wash your hands after changing a baby's diaper.</i> | True | False |
| 9. <i>Respiratory infections and diarrhoeal diseases cannot be prevented by proper handwashing.</i> | True | False |
| 10. <i>The correct order to wash your hands is: Add soap, add water, rinse, scrub, dry with a clean towel.</i> | True | False |
| 11. <i>You should always use soap for washing your hands.</i> | True | False |
| 12. <i>40% of the world's population live in areas where water and soap are inaccessible.</i> | True | False |
| 13. <i>Using water in a water basin for washing your hands is just as good as using running water.</i> | True | False |
| 14. <i>During the Covid-19 pandemic, it is important to wash your hands even more frequently.</i> | True | False |

Thank you for taking this survey. Now let's have some fun!

Appendix 4: Post-intervention survey



Thank you for participating in the Paint and Prevent handwashing workshop. This survey is not a test, and your knowledge will not be compared to the knowledge of the others'. If you have any questions, please do not hesitate to ask.

DO NOT WRITE YOUR NAME ON THIS PAPER.

Age (optional):

Gender (optional):

Please answer the following questions. Circle the answer that fits you the best.

- | | | | | | |
|--|------------|-------------------|-----------|--------------|-------|
| 1. <i>If I have a place for washing my hands, I wash them before I eat.</i> | Every time | Almost every time | Sometimes | Almost never | Never |
| 2. <i>If I have soap, I use it when I wash my hands.</i> | Every time | Almost every time | Sometimes | Almost never | Never |
| 3. <i>If I have access to running water, I use it when washing my hands.</i> | Every time | Almost every time | Sometimes | Almost never | Never |

Please answer the following questions. Circle what you think is the correct answer (True) or (False).

- | | | |
|--|------|-------|
| 4. <i>Touching your face with dirty hands may spread germs to your nose, mouth or eyes.</i> | True | False |
| 5. <i>You should always use hot water for washing your hands.</i> | True | False |
| 6. <i>You should dry your hands with a clean towel after washing them.</i> | True | False |
| 7. <i>You should always rub your hands together at least 30 seconds when washing them.</i> | True | False |
| 8. <i>You should always wash your hands after changing a baby's diaper.</i> | True | False |
| 9. <i>Respiratory infections and diarrhoeal diseases cannot be prevented by proper handwashing.</i> | True | False |
| 10. <i>The correct order to wash your hands is: Add soap, add water, rinse, scrub, dry with a clean towel.</i> | True | False |
| 11. <i>You should always use soap for washing your hands.</i> | True | False |
| 12. <i>40% of the world's population live in areas where water and soap are inaccessible.</i> | True | False |
| 13. <i>Using water in a water basin for washing your hands is just as good as using running water.</i> | True | False |
| 14. <i>During the Covid-19 pandemic, it is important to wash your hands even more frequently.</i> | True | False |



2 (2)

Please answer the following questions and give us feedback.

- | | | | | | |
|---|----------------|----------------|--------------------------|-------------------|-------------------|
| 15. <i>My skills and knowledge in handwashing have improved today.</i> | Strongly agree | Somewhat agree | Do not agree or disagree | Somewhat disagree | Strongly disagree |
| 16. <i>I have learned new things about how handwashing can improve my health today.</i> | Strongly agree | Somewhat agree | Do not agree or disagree | Somewhat disagree | Strongly disagree |
| 17. <i>It was easier to learn about handwashing because we painted, too.</i> | Strongly agree | Somewhat agree | Do not agree or disagree | Somewhat disagree | Strongly disagree |

Thank you!

Appendix 5: Participant Information Sheet



Participant information sheet

PARTICIPANT INFORMATION SHEET

Paint and Prevent - a visual arts-based infection prevention campaign for adolescents 15 to 17 years old in Tanzania.

We would like to invite you to join our study on the outcomes of a visual arts-based infection prevention campaign. The campaign consists of one-day workshops, during which basic infection prevention skills and knowledge, are being learnt during the workshop, you will have the opportunity to produce artwork based on what has been discussed. You have been chosen to participate in this study from Art in Tanzania's customers by the staff of Art in Tanzania.

Two surveys will be given to you during the workshops: One before, and one after. They are not exams, and your personal skills on infection prevention will not be measured. Your name will not be required to be written on the surveys. You will be asked the same questions after the workshop, and these answers will be compared with the earlier answers collected to know the outcomes of the workshop. The workshop will have 5 to 10 participants, adolescents 15 to 17 years old. Participants must have oral and written English language skills to complete this study.

This information sheet describes the study and your role in it. Before you decide, it is important that you understand why the research is being done and what it would involve of you. Please take time to read this information and discuss it with others, like your parents if you wish. If there is anything that is not clear, or if you would like more information, please ask the listed contact personnel. After that, we will ask you to sign a consent form to participate in the study.

VOLUNTARY NATURE OF THE STUDY

The participation in this study is voluntary. You can withdraw from the study at any time without giving any reason and without there being any negative consequences. If you withdraw from the study or withdraw your consent any data collected from you before the withdrawal can be included as a part of the research.

THE PURPOSE OF THIS STUDY

This study aims to create an infection prevention campaign focusing on hand washing skills and knowledge for adolescents aged 15 to 17 in Tanzania. The infection prevention campaign will be a visual art-based workshop where participants get to create their own pieces of art regarding the feelings and thoughts hand washing as a subject raise. The objectives of this study are to study the outcomes of a visual arts-based infection prevention campaign and to increase the participants' knowledge and skills in hand washing, as well as measure the pre and post intervention knowledge participants had regarding the topic.

WHO IS ORGANISING AND FUNDING THE STUDY?

This study is organised by Global Health and Crisis Management students Emmi Hamara and Noemi Watson, as they will be completing their Master's thesis. The University behind the research is Laurea University of Applied Sciences in Helsinki, Finland. The main supervisor of this research is principal lecturer Teija-Kaisa Aholaakko. The partner organisation in the study is Art in Tanzania.

POSSIBLE BENEFITS OF TAKING PART

Participant may benefit by the possible increased knowledge on infection control and hand washing skills. Also, the visual-art piece created as an outcome of this study may be taken home as a memory from the workshop.

POSSIBLE DISADVANTAGES AND RISKS OF TAKING PART

There should be no discomfort or disadvantages of attending as a research participant. The participant should notify the researchers immediately if they are experiencing any discomfort during the workshops. We aim to provide a safe and enjoyable environment to all. All discrimination towards each other is forbidden.

WHAT WILL THE PARTICIPATION INVOLVE?

Participation will involve attendance to a visual-art based workshop in groups of 5-10 participants. The workshops will be taking place in the faculties of One School organized by Art in Tanzania. Approximately four hours of attendance will contain a morning discussion on hand washing as infection prevention, individual visual-art creation based on the thoughts and feelings hand washing raises, lunch and exhibition, as well as open reflection on the thoughts the workshop gave the participants. During the day there will be a pre- and post-survey regarding topics on skills, knowledge and traits regarding handwashing. The survey is not a test, nor will it be graded.

- Participation in this workshop study will take approximately two to four hours per participant.
- Each workshop contains 5 to 10 participants.
- The workshops regarding this study will be repeated five times on different days, with different groups of participants for each workshop.
- The participants will meet the researchers throughout the workshop study day; hence they will oversee organising practicalities.
- During the study participants will be discussing handwashing skills and knowledge.
- Participants will be attending a pre- and post-survey before and after the workshop.
- During the workshop participants will be creating a piece of visual art, based on the feelings and thoughts raised discussing about hand washing.
- This study will be performed as a quantitative study
- The research will take place at the faculties organised by Art in Tanzania in the city of Dar es Salaam.

FINANCIAL INFORMATION

Participation in the workshops will be cost free to all participants. The participant oversees their own transportation to the venue of the study. Supplies needed during the workshop will be provided by the researchers, also a free of charge small snack will be offered during a break of the workshops.

INFORMING ABOUT THE RESEARCH RESULTS

This research study is a Master level thesis conducted by two students from Laurea University of Applied Sciences. Complementing the open access policy in research, this thesis will be accessible online free of charge for everyone. Participants survey answers cannot be identified or tracked to a participant. The results will be published in Theseus, an online publication platform for theses of the Universities of Applied Sciences in Finland. The results will also be published on Global Window - a publishing platform of Laurea University of Applied Sciences.

TERMINATION OF THE STUDY

Participation in this study is completely voluntary. Termination of the study is made possible by notifying the researchers of a possible withdraw. Participants terminating the study don't need to provide a reason regarding the withdraw. Termination of the study is made possible at any stage of the study.

TYPES OF PERSONAL DATA THAT WILL BE COLLECTED

The data is collected from the participants through pre- and post-intervention surveys. There will be no personal data on the surveys. Original documents or transferred data will not be handed out to the research registry. Participants' names will be collected into a centralised data file in the form of the consent forms. The forms will be stored in a safe place and destroyed 6 months after publishing the results of the study.

FURTHER INFORMATION

The Finnish National Board of Research Integrity will be referred to and used as a guidance in ethical issues, and permission from The Human Sciences Ethics Committee of the Universities of Applied Sciences in the Helsinki Metropolitan Area, Finland will be obtained. GDPR applies to research done in European Union, but it will also be followed in the study carried out in Tanzania. The Constitution of the United Republic of Tanzania regulates personal rights for privacy, and it will be followed. Guidance from Laurea University of Applied Sciences' data protection personnel will be followed. Personal data, such as names, will not be collected in the surveys, as they are not relevant to the study. Gender and age are voluntary questions in the participant sheets but cannot be traced back to the participant.

DATA CONTROLLER OF THE STUDY

Data controller is the natural or legal person, public authority, agency or other body which, alone or jointly with others, determines the purposes and means of the processing of personal data. Within this study, personal data will be processed according to the European Union General Data Protection Regulation (679/2016) and current national regulation. Only the researchers and the supervisor will have access to the original data, a key to the lock of the storage place, and necessary passwords. They share the responsibility of keeping the data safe both in Tanzania, as well as in Finland. The researchers, as well as the supervisor of the project, will have the rights to the data according to Finnish legislation and Laurea University of Applied Sciences guidelines.

RESPONSIBILITIES OF JOINT DATA CONTROLLERS

The Global Health and Crisis Management Master's students Emmi Hamara and Noemi Watson oversee the controlling and safety of the data.

Contact persons for matters related to the processing of personal dataResearcher:

Emmi Hamara

Bachelor of science in Nursing, Master's degree student in Global Health and Crisis Management

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Study supervisor:

Teija-Kaisa Aholaakko, PhD, LicSc, RN

Principal Lecturer

Teija-Kaisa.Aholaakko@laurea.fi

Appendix 6: Team Agreement

29.10.2020

TEAM AGREEMENT

Together discussed and agreed team rules will be written down in the team agreement. The agreement requires all team members to act in accordance with the agreed rules. The purpose of the team agreement is to clarify and facilitate the team work during the project.

Project 's name	Paint and Prevent- An Intervention Study on The Outcomes of Visual Arts-Based Workshops in Handwashing Skills and Knowledge with Adolescents aged 15 to 17 in Tanzania.		
Project 's targets	The aim of the project is to create a visual arts-based infection preventing campaign for adolescents aged 15 to 17 in Tanzania, focusing on handwashing knowledge and skills.		
Team 's targets	To provide a safe, informative and fun workshop day for adolescents participating in the workshop. To study the outcomes of the workshops in the participants' handwashing knowledge and skills		
Team Responsibilities and roles (write here other roles also, e.g. who is responsible for communication , budget, social media etc.	Name of the team member	Responsibilities and roles	Personal learning targets
	Noemi Watson	Project manager/researcher	Creating an arts in health intervention. Carrying out a quasi-experimental study.
	Emmi Hamara	Project manager/researcher	Creating an arts in health intervention. Carrying out a quasi-experimental study.
	Teija-Kaisa Aholaakko	Thesis supervisor	Supervising a quasi-experimental study carried out abroad and with minors.
	Kari Korhonen	AIT coordinator	Collaborating in a thesis project.

Presence/absences:	Art In Tanzania responsibilities:
<ul style="list-style-type: none"> • What kind of presence/participation we are expecting from each other? • How do we inform our absences? 	<ul style="list-style-type: none"> • Provides faculties to hold the workshops on five different days. • Recruits 5-10 adolescent participants aged 15 to 17 with English language skills for each workshop on five different days. • Takes care of necessary ethical permits for the study in Tanzania. • If researchers/ workshop holders are not able to fly to Tanzania due to the Covid-19 pandemic, AIT will help to set up an online opportunity regarding the workshops, and commits to assist in the workshops in Tanzania. In such case, the group sizes and numbers will be decreased. Alternatively, the researchers will train two AIT members via Zoom or Teams meeting to carry out the workshops and to collect the data in Tanzania.

Appendix 7: The Finnish National Board on Research Integrity Description of the Study

THE HUMAN SCIENCES ETHICS COMMITTEE OF THE UNIVERSITIES OF APPLIED SCIENCES IN THE HELSINKI METROPOLITAN AREA

To whom it may concern,

Students Noemi Watson and Emmi Hamara at Laurea University of Applied Sciences have sent the 1st of December 2020 their study plan “**Paint and Prevent – An Intervention Study on The Outcomes of Visual Arts-Based Workshops in Handwashing Skills and Knowledge with Adolescents in Tanzania**” to THE HUMAN SCIENCES ETHICS COMMITTEE OF THE UNIVERSITIES OF APPLIED SCIENCES IN THE HELSINKI METROPOLITAN AREA for ethical review.

In Finland, research with human participants must comply with the guidelines of the Finnish National Board on Research Integrity TENK¹ [The ethical principles of research with human participants and ethical review in the human sciences in Finland. Finnish National Board on Research Integrity TENK guidelines 2019 \(pdf\)](#).

Laurea University of Applied Sciences has undertaken to comply with TENK's guidelines. The guidelines do not cover medical research as defined by law (Medical Research Act 488/1999) or other research designs where ethical review is a separate obligation laid down by law.

According to the guidelines, research is to be conducted in such a way that the dignity and autonomy of human research participants is respected and the research does not cause significant risks, damage or harm to research participants, communities or other subjects of research.

Ethical review is to be carried out prior to gathering data, if the research contains one or more of the following factors:

1. Participation in the research deviates from the principle of informed consent. Participation is not, for example, voluntary, or the subject is not given sufficient or correct information about the research.
2. The research involves intervening in the physical integrity of research participants.
3. The focus of the research is on minors under the age of fifteen, without separate consent from a parent or carer, or without informing a parent or carer in a way that would enable them to prevent the child's participation in the research.
4. Research that exposes participants to exceptionally strong stimuli.
5. Research that involves a risk of causing mental harm that exceeds the limits of normal daily life to the research participants or their family members or others closest to them.
6. Conducting the research could involve a threat to the safety of participants or researchers or their family members or others closest to them.

Decision: Based on the submitted material none of the above factors is met and therefore, ethical review is not required in Finland.

The human sciences ethics committee of the universities of applied sciences in the Helsinki Metropolitan area, Helsinki, Finland 16th of December 2020



Chair, Jyrki Kettunen



Secretary, Irene Gröhn

¹ The Finnish National Board on Research Integrity TENK is an expert body appointed by the Ministry of Education and Culture and tasked with promoting research integrity and preventing research misconduct in Finland. Further information about the ethical review system in Finland is available at www.tenk.fi.

Appendix 8: Invitation letter



**WELCOME TO PARTICIPATE IN
PAINT AND PREVENT –
A VISUAL ARTS-BASED HANDWASHING
WORKSHOP.**

**YOU WILL LEARN HOW HANDWASHING CAN
HELP PREVENT ILLNESS, AND CREATE YOUR
OWN PIECE OF ART.**

VENUE:

DATE:

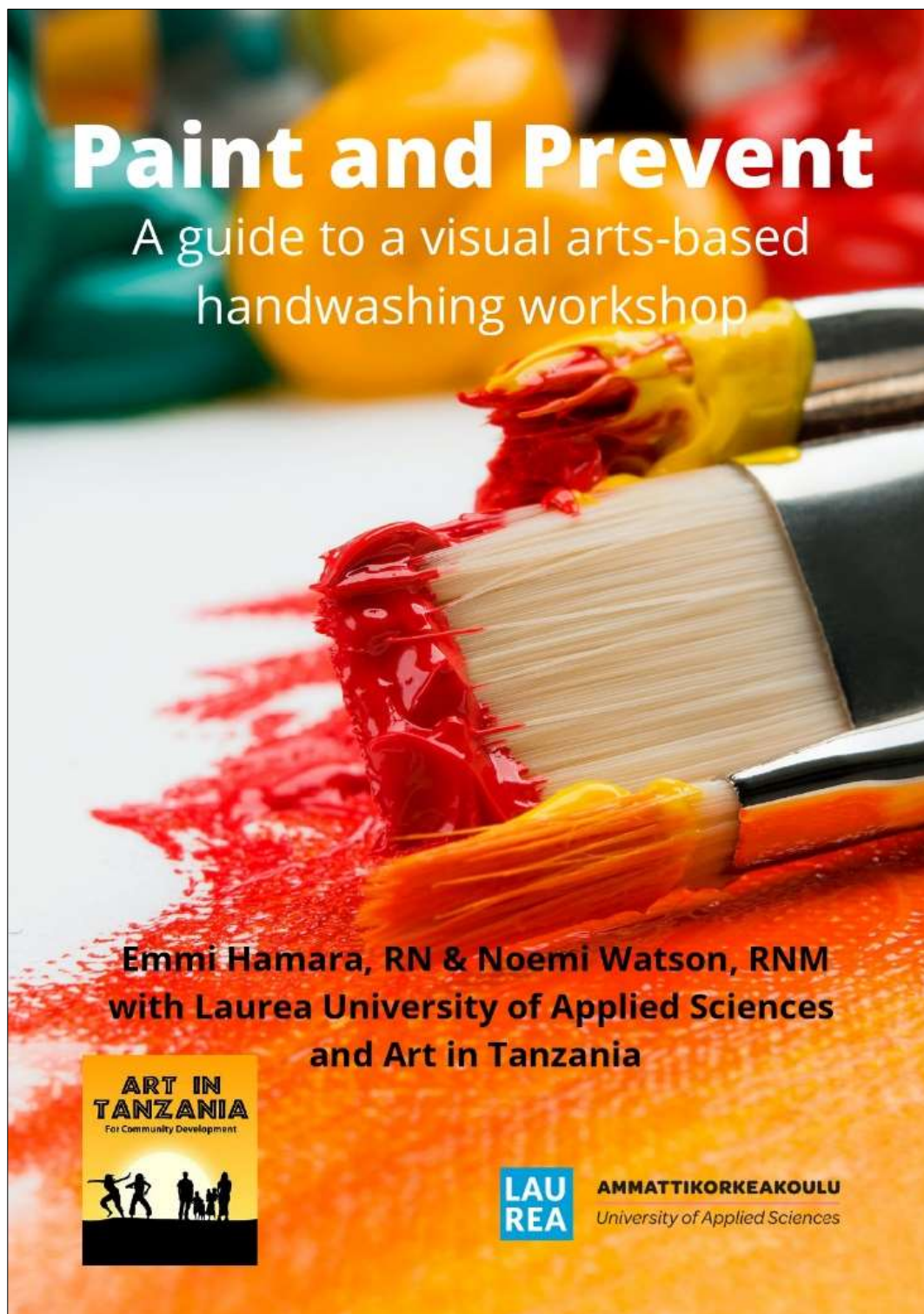
Participation in the workshops requires English reading and speaking skills. Participants must be between 15 and 17 years of age.

The workshops are a part of an intervention study carried out in collaboration with Art in Tanzania and Laurea University of Applied Sciences from Finland. For more information please contact Art in Tanzania at finland@artintanzania.org.

LAU REA *Together we are stronger*

**ART IN
TANZANIA**

Appendix 9: The workshop handbook



Introduction

Welcome to carry out a Paint and Prevent workshop!
This handbook introduces a day of fun, mixing visual arts and facts about the importance of handwashing in infection prevention.

The workshop you are about to carry out aims at teaching the participants handwashing skills and knowledge. It consists of three parts: discussing handwashing, strengthening memories with a painting session, and reflecting through an art exhibition.

Use any materials or venue that best fit your audience!

Feel free to experiment and try other art forms, too! Maybe change the art exhibition to a talent show?



The items

First, familiarise yourself with the handwashing items below and the additional information in the links at the end of this handbook.

If you feel an item has expired or has dated information, or it does not address the participants of your workshop, you can change it to another handwashing topic to better fit your audience.

Note that health information changes. Always make sure to provide correct and current information!



Ten key items:	Identifying learning needs:	Transferrable knowledge:
Skills		
1. Soap	Identifying the relevance of soap in handwashing manners.	Soap should be used every time hands are washed, to remove pathogens efficiently.
2. Timing	Identifying when washing your hands is necessary.	The correct handwashing times: Before, during, and after preparing food; before eating food; before and after caring for someone at home who is sick with vomiting or diarrhoea; before and after treating a cut or wound; after using the toilet; after changing diapers or cleaning up a child who has used the toilet; after blowing your nose, coughing, or sneezing; after touching an animal, animal feed, or animal waste; after handling pet food or pet treats, and after touching garbage
3. Drying	Identifying the importance of drying hands regarding infection prevention.	Hands should be dried completely dry with a clean towel after washing your hands, to prevent pathogens from attaching to the skin
4. Technique	Identifying the need to cover each part of your hands, while washing your hands. Identifying the correct order and duration of handwashing.	The correct order for handwashing is: add water, add soap, scrub, rinse, dry. Hands should be scrubbed together 20 seconds after adding soap to remove pathogens efficiently.
5. Running water	Identifying the importance of running water.	Running water is an important part of handwashing for removing pathogens and soap efficiently, also in the reduction of skin irritation from soap. It is also safer than stagnated water. Water does not have to be hot. Cool water may cause less skin irritation and is more environmentally friendly than warmer water



Knowledge		
6. Preventing illness	Identifying that handwashing prevents diarrheal disease and respiratory infection related illness and deaths.	Washing hands regularly prevents respiratory infections and diarrhoeal diseases, common cold, flu and the spread of anti-microbial resistant bacteria.
7. Locating pathogens	Identifying the locations and pathogens living on one's hands.	Most of the microbes on one's hands live under the fingernails. Normal human flora (germs) can be dangerous in wrong places.
8. Routes of transmission	Identifying the most common ways pathogens move from hands to people	Through hands to mouth, nose and ears, as well as surfaces.
9. Global Infection prevention	Identifying the effects of handwashing in a global health aspect.	Handwashing is one of the most effective preventative method regarding infection control, and during the Covid-19 pandemic handwashing should be even more regular. Prevents antibiotic resistant pathogens.
10. Accessibility	Identifying global issues with running water and lack of soap.	40% of the world's population live in areas where water and soap are inaccessible. Only 19% of adolescents in Tanzania wash their hands after using toilet.



Materials

You will need a place such as a room or an open outdoor space, which comfortably accommodates the staff and participants attending the workshop.

A variety of art supplies for painting or drawing will be needed, and the more the better! The paper or cardboard used should be sturdy, and there should be at least a couple of sheets to spare per participant.

**The workshop could take anything between
2 to 4 hours.**



Discussion

The workshop starts with you telling the participants why they are there. They have been invited to the workshop to learn about handwashing skills and knowledge. Emphasise that they are all there to have fun and to learn about handwashing!

All participants, as well as you, introduce themselves. You may ask them also if they like drawing or painting.

Let everyone have a chance to speak. This may take 10 to 20 minutes.



Start a discussion about the ten items. The structure is simple: bring up any of the topics by asking a leading question about the participants' habits and knowledge. **For example:**

"How many of you use soap if it's available when washing their hands?"

"Do you have running water available when washing your hands? Do you use it? Do your friends have access to running water?"

"Do you think it is important to wash your hands more because of the Covid-19 pandemic?"

"Who could show the correct handwashing technique?"



“How many washed their hands today before breakfast?”

“Do you like to dry your hands after washing them?
Why do you think this may be important?”

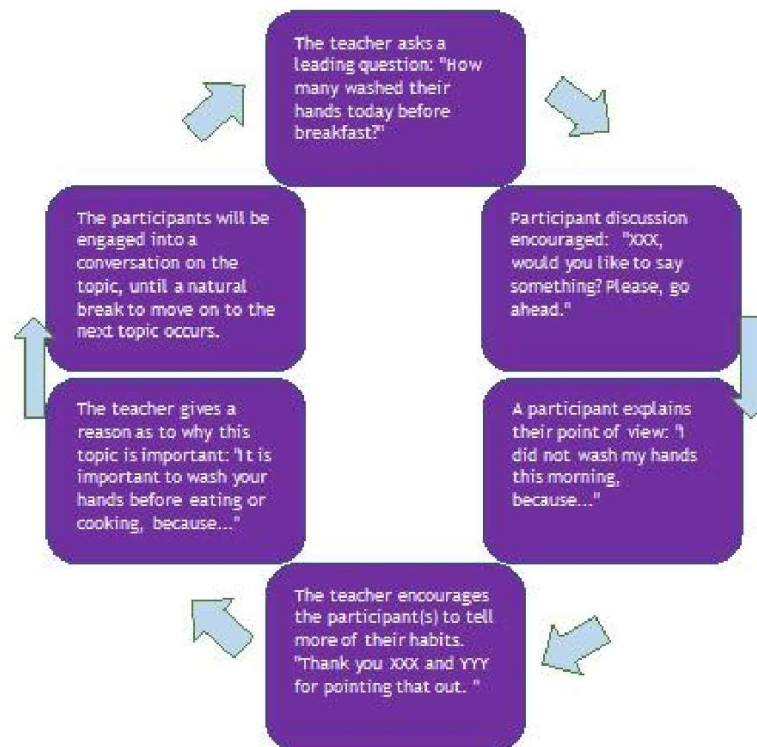
“Do you think you can prevent illnesses by washing your hands?”

“Do you think your hands may be extra dirty in certain places?”

“Does anyone know how the germs get into your body from your hands?”

“What other benefits could one get from washing their hands?”





After each question, allow time for discussion. Encourage the participants to give out their opinion and to share their thoughts and ideas. The participants may come from different backgrounds, and their ideas may differ.

During the conversation on each topic, at some point, **provide the correct information.**

The discussion should take about 30 to 60 minutes. Make sure you go through each one of the ten handwashing topics.



Painting

After you have talked about each of the items, start painting! Introduce the task: everyone can paint or draw about their feelings or thoughts about the discussion. Give them some ideas: they could for example visualise a situation where they are using the correct handwashing technique, or draw germs, or paint something about their current handwashing habits. Anything goes!

Painting may take anything from 30 to 60 minutes or even longer, depending on the participants, and the time you have reserved for the workshop. Remember to provide help with using the art supplies, as well.



Exhibition

Finally, it is time for a little art exhibition! Hang or lay out the artwork on a wall, desks or ground. Let everyone introduce what they have done and encourage discussion. There are no “wrong answers” in this part, and the artwork is not graded or critiqued. This is also a fine opportunity to provide the participants with more information on the 10 handwashing items if you notice something is still misunderstood.

Last, give the participants their artwork to take home with them as a reminder of what they have just learned!



Additional information at:

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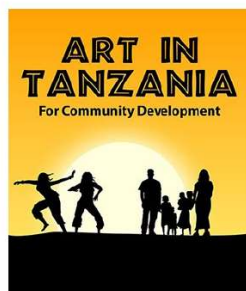
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This framework was created as a part of two
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The partners of the project were Laurea
University of Applied Sciences and Art in
Tanzania.



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