

## Art in health for young people: Reducing risks for human mortality

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## Art in health for young people: Reducing risks for infant mortality

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Keywords:	health messaging, infant mortality, reducing risks, young people, schools
Abstract:	<p><b>Background:</b> In the UK, infant mortality rates are highest among families living in the most socio-economically deprived neighbourhoods. The Midlands region is among the areas with the highest rates in the country. Key modifiable risk factors, such as teenage pregnancy, smoking during pregnancy, and not breastfeeding contribute significantly to these statistics.</p> <p><b>Objectives:</b> To develop artistically co-created animated videos, made by young people for their peers, that address four key health messages focused on reducing the risk of infant mortality and promoting healthier future families.</p> <p><b>Setting:</b> The Midlands region in the UK.</p> <p><b>Method:</b> Nine students were purposively selected from a school in a socio-economically disadvantaged neighbourhood in the Midlands. The students interviewed five artists and selected one to collaborate with. Together with the chosen artist, they co-created four animated videos conveying key health messages related to reducing infant mortality. This report focuses on the students' reflections on their experience, particularly their role in developing new visual content around healthier futures. The artist's reflections, along with team feedback and discussions, were also documented.</p> <p><b>Results:</b> The process was embraced by young people as part of their formal education. Students felt valued, recognised the seriousness of the risks, and were motivated to actively contribute to change. The co-creation of the artwork provided a meaningful and realistic context for their engagement. Access to support during message delivery, the importance of open communication, and avoiding judgment or stigma were all identified as key priorities.</p>

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	Conclusion: We describe how artists, researchers, and young people in schools can collaborate to artistically co-create health care messages related to infant mortality.

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## Art in health for young people: Reducing risks for infant mortality

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### Abstract

**Background:** In the UK, infant mortality rates are highest among families living in the most socio-economically deprived neighbourhoods. The Midlands region is among the areas with the highest rates in the country. Key modifiable risk factors, such as teenage pregnancy, smoking during pregnancy, and not breastfeeding contribute significantly to these statistics.

**Objectives:** To develop artistically co-created animated videos, made by young people for their peers, that address four key health messages focused on reducing the risk of infant mortality and promoting healthier future families.

**Setting:** The Midlands region of England.

**Method:** Nine students were purposively selected from a school in a socio-economically disadvantaged neighbourhood in the Midlands. The students interviewed five artists and selected one to collaborate with. Together with the chosen artist, they co-created four animated videos conveying key health messages related to reducing infant mortality. This paper shares students' reflections on their experience, particularly their role in developing new visual content for healthier futures. The artist's reflections, along with team feedback and discussions, are also documented.

**Results:** The process was embraced by young people as part of their formal education. Students felt valued, recognised the seriousness of the risks, and were motivated to actively contribute to change. The co-creation of the artwork provided a meaningful and realistic context for their engagement. Access to support during message delivery, the importance of open communication, and avoiding judgement or stigma were all identified as key issues to be addressed when undertaking future work of this kind.

**Conclusion:** We describe how artists, researchers, and young people in schools can collaborate to artistically co-create health care messages related to infant mortality.

**Key Words:** infant mortality, education, empowerment, young people

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## Background

Infant mortality (the death of a live born baby within its first year of life) rates in the Midlands are some the highest in the UK. For example, in Leicester, the rate sits at 7.7 per 1000 live births, while the national average is 4.1 per 1000 live births (UK Government, Office for Health Improvement and Disparities, 2025). In addition to excellence in clinical care, addressing socio-economic determinants and behavioural practices upstream of pregnancy and birth are key in contributing to reducing infant mortality risks (Ho et al., 2024).

Systematic reviews of pre-conception health confirm that smoking, alcohol and other substance use, poor diet and early pregnancy in adolescents increase the odds of low birth-weight, prematurity and infant death (Padhani et al., 2024). Educational materials and interventions currently exist, or are under development, to support adolescents and young people in acquiring parenting and caregiving knowledge (e.g., on how to keep newborns healthy). These include formal textual resources, school-based curricula, and experiential learning tools such as infant simulators (Brinkman et al., 2016; Dinh et al., 2024; Kumar et al., 2010; Reyes et al., 2019). However, significant challenges remain regarding the accessibility, engagement, and long-term effectiveness of these approaches. For example, a pilot study conducted in Ontario evaluating breastfeeding interventions integrated into the secondary school curriculum found significant post-test increases in participants' breastfeeding knowledge ( $p < 0.001$ ), attitudes ( $p < 0.001$ ), and intentions to exclusively breastfeed in the future ( $p < 0.05$ ) (Reyes et al., 2019). A further study conducted in Australia found that pregnancy and parenting education programmes using infant simulators can improve short-term attitudes, but have little impact on actual pregnancy rates in the absence of comprehensive sex education and access to contraception (Dinh et al., 2024). Similarly, a randomised controlled trial of the Virtual Infant Parenting (VIP) programme in Australia found that girls in the intervention group were more likely to experience a birth or abortion before the age of 20 compared to the control group, highlighting the limitations of standalone approaches (Brinkman et al., 2016).

In contrast, co-produced health education programmes embedded within existing curricula have shown greater acceptability, feasibility, and in some cases, improvements in health-related behaviours and outcomes among young people (Jones et al., 2024; Kilfoy et al., 2024). One such programme, designed and implemented in Italy with adolescent co-producers, reached over 5,000 peers and was associated with reported behavioral changes, including improved diet and increased physical activity (De Rosis et al., 2020). Nevertheless, methodological transparency in such health education programmes is often limited, and well-documented exemplars of co-produced interventions remain scarce (Raeside, 2025), particularly those involving artistic materials co-created with young people in formal education settings.

To address this, a composite parent education and empowerment programme (the STORK programme (Pillay, 2018b)) was initiated to provide clear and simple information to new parents on how to keep new babies healthy, including providing information and confidence in simple first aid for parents with young children. The material was delivered in a format that sought to promote engagement between health service provider and families using a mobile application, and that provided visual information that could be accessible to parents with varying degrees of literacy (Pillay, 2018b; Pillay, 2020). The initial work was well received by new parents and neonatal professionals (Pillay, 2018a; Pillay, 2019; Pillay et al., 2022; Pillay, 2017)

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3 We recognised that deep seated inequalities impact on infant mortality risks long before  
4 pregnancy, and that to change the risks in the long term requires an enhanced approach including  
5 health messaging aimed at a younger and perhaps differently perceptive audience. Our belief  
6 was that reducing risks associated with infant mortality through early education and  
7 empowerment in young people is critical to achieving longer term reductions in infant mortality  
8 risks and would empower young women and men, whenever they do decide to have a family, to  
9 make choices that serve the best interest of their family and the life chances of their babies. A  
10 clinician, in collaboration with public health, the city council, local schools, and local maternity  
11 and neonatal services in Leicester, and the School of Art at the University of Wolverhampton  
12 worked together in the development of informative digital material for young people that could  
13 be distributed through social media channels.

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17 The concept was labelled STORK for Schools (Early STORK), and a simple set of four key  
18 messages that could be delivered by school nurses by the public health authority in  
19 Wolverhampton was developed in October 2018. Its motto, which was developed with students,  
20 was 'Choose healthy, Choose You!'. Early STORK included sharing with students the risks of harm  
21 to mother and baby from 1) smoking in pregnancy, 2) alcohol and recreational substance misuse  
22 in pregnancy, and 3) teenage pregnancy, together with 4) the benefits of breast feeding for  
23 healthier future families. These are key behavioural factors currently associated with infant  
24 mortality in the UK (Ho et al., 2024).

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26  
27 This messaging subsequently formed part of the Black Country and West Midlands  
28 strategic plan for healthier futures (Black Country Integrated Care Board, 2023) in the form of  
29 face to face personal social, health and economic education (PHSE) sessions run by school nurses.  
30 However, it was recognised that the team needed to develop the information materials into a  
31 format that would be easy to deliver, consistent, acceptable within a wide range of  
32 social/economic contexts, but most importantly with the capacity to engage and activate a wide  
33 audience of young people in schools and colleges to share and discuss the messaging through  
34 their social media platforms. It was recognised that for this kind of health messaging to be  
35 developed and used, it would need to speak to and connect with young people.

36  
37 Although the initial logo and strap line had been designed in partnership with young  
38 people, the overall 'look' and appeal of the material seemed aimed at either a much younger or  
39 more mature audience. The team needed to develop a new 'look' for the work. The challenge  
40 was to find an artist/designer who could relay the experiences of the young people and the  
41 knowledge of the clinicians into a 'super cool' graphic. This has since been achieved. We now to  
42 report on our experience with this work to co-create visual art material made by young people  
43 for young people in relation to established key messages associated with reducing risks for infant  
44 mortality. The role that the artist played in working to give young people voice to their lived  
45 experience in developing the new graphics around their own healthier futures is described.

## 46 47 48 49 **Methods**

### 50 51 52 ***Participants***

#### 53 54 55 *The multidisciplinary team*

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3 A multidisciplinary team comprising three researchers (a clinician and two art lecturers), a  
4 schoolteacher and students (young people in school education) was established in December  
5 2020. A large comprehensive school in the West Midlands was selected for the study. This school  
6 was chosen because co-authors HS and MA had established links with it, ensuring ease of access.  
7 Additionally, the school had a highly ethnically diverse student population and served  
8 communities ranked among the most deprived in the country according to the Indices of Multiple  
9 Deprivation (IMD) profiles (2023). Both ethnicity and deprivation are strongly associated with  
10 infant mortality in England, reflecting underlying social and economic inequalities (Gallimore,  
11 2025).

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14 Permission from the head teacher and school lead for PHSE were secured, and a group of  
15 students currently undertaking GCSE (General Certificate of Secondary Education) and further  
16 education studies (sixth form) was recruited to form a working group. Consent from parents was  
17 obtained to include students in focus group discussions about the development of video material  
18 on the four key messages for promoting their healthier future families. It was agreed to keep  
19 details of the school and participating students anonymous.

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21  
22 The clinician shared with the schoolteacher and school team the key messages to be  
23 conveyed, as described earlier. An introductory session was held with the schoolteacher and with  
24 students, virtually, in which the messages relating behavioural changes that could contribute to  
25 healthier future families were discussed. Nine ethnically diverse students representing Caucasian,  
26 Black, Asian and mixed ethnicities from different socio-economic backgrounds were then chosen  
27 by the schoolteacher to work on the project with a teacher lead.

### 28 29 30 ***Selection of the artist***

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33 An open call was put out through local creative networks seeking a graduate artist to work on  
34 the project and a shortlist of five artists pitched their ideas to the whole team, including the  
35 school students. The artists who were shortlisted were then interviewed virtually, by the  
36 university team, clinician, students, and the teacher. The students and teacher then selected the  
37 artist with whom they had the best rapport and a style that would speak to them and their peers  
38 effectively. The preferences of the young people informed the final selection of an artist. The  
39 artist finally chosen was a freelance artist with experience working with young people and small  
40 groups. They were contracted to develop the digital materials and had UK Disclosure and Barring  
41 Services (DBS) clearance for work with young people.

### 42 43 44 ***Work on the project***

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47 For the messages to have impact, the working group and the artist needed to collaborate in  
48 shaping the language, tone, and visual signifiers in the audiovisual material to better resonate  
49 with the target age group of 13–15-year-olds. The artist was contracted to engage in a workshop  
50 with the young people and on-line sessions over six months, to develop animated shorts around  
51 the four key messages shared by the clinician. The shorts were created by the artist, with the  
52 young people remaining involved in the production process and refining the work at every stage,  
53 including recording the final voice narratives. One male and one female student voice were  
54 selected for the final audio-visual production of the digital material. The clinical team member  
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3 was also able to influence the production process to ensure the messaging was accurate and  
4 appropriately targeted. The teacher was always present, and the sessions were conducted in the  
5 school setting. The contact point for the students with the artist was the university and the  
6 schoolteacher.  
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### 8 9 ***Material collected and analysed***

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11 Nine students from the school participated in a collaborative process to co-develop animated  
12 video content delivering key health messages on reducing infant mortality and promoting  
13 healthier future families. The process began with focus group sessions held during school hours  
14 in a designated classroom. These sessions included open discussion about a draft script, the  
15 collaborative preparation of a storyboard (see online supplementary material A), and  
16 brainstorming activities (see online supplementary material B).  
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18  
19 To guide these discussions, an interview guide was developed to explore students'  
20 perspectives on the relevance, tone, and clarity of the draft script, as well as to identify themes,  
21 language, and imagery that would resonate with their peers. The guide included open-ended  
22 questions and creative prompts designed to support reflection on both message content and  
23 visual style. The theoretical framework underpinning the analysis was grounded theory  
24 (Charmaz, 2006), allowing themes to emerge inductively from the data. From the full dataset,  
25 including focus group discussions, free-text reflections from students, and team observation  
26 notes, we identified five overarching categories: perceived appropriateness, partnership, being  
27 judged, realistic conversation, and developing ideas.  
28

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30 Initial coding of the data led to the development of these core categories, which  
31 reflected recurrent patterns in how students experienced and contributed to the co-creation  
32 process. From these categories, five sub-themes were further developed: reach and inclusion,  
33 knowledge, support, challenges, and innovation. These sub-themes offered more specific  
34 insights into the factors that shaped students' engagement with the development of key  
35 messages for healthier futures. A COREQ checklist for the study is provided as online  
36 supplementary material C.  
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39 Based on the students' input, the artist worked collaboratively with them to refine the  
40 scripts (Figure 1) and develop scenarios for the animated videos. During this creative process, the  
41 artist also captured free-text reflections from the students to inform the final design. Additional  
42 insights were gathered from the artist's reflections, research team discussion notes, and informal  
43 session feedback. To avoid placing pressure on students many of whom were unfamiliar with this  
44 type of engagement and came from socio-economically deprived and culturally diverse  
45 backgrounds, direct quotations were not recorded. This approach helped foster a safe,  
46 supportive environment that encouraged open participation. Two researchers coded the data.  
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### 49 ***Ethics***

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52 Ethical approval was provided by the University of Wolverhampton Faculty of Arts, Business and  
53 Social Sciences Ethics Committee on 6 May 2021 for 'The STORK Programme: development of  
54 social media content for young people' (project title). Signed parental/carer permission forms  
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3 were completed for all the students involved. Verbal assent from participating students was also  
4 obtained.  
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## 6 7 **Findings**

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9 The following five themes were developed from our analysis of data collected through focus  
10 group discussions with students, informal session feedback and team discussion notes. These  
11 themes reflect students' perspectives and experiences in co-developing key messages for  
12 healthier. Incorporating these insights along with students lived experiences and preferences,  
13 the artist and students collaboratively developed four short, animated videos, with text written  
14 and narrated by the students themselves. The final videos are available for viewing at on the Early  
15 Stork website (Pillay, 2021).  
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### 18 19 ***Reach and inclusion***

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21 Students reported feeling valued by being involved in the preparation of video material with a  
22 focus on key messages for healthier future families. They understood the gravity of the clinical  
23 context and wanted to actively contribute to change.  
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### 26 27 ***Knowledge***

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29 Students appreciated the opportunity to have a realistic discussion about reducing the risks of  
30 infant death without stereotyping the individuals concerned. Creating a neutral environment by  
31 factually presenting information in a realistic way was important to them.  
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34 'We talked about depictions of these young mums and how we didn't want to fall into  
35 stereotypes. Interesting ideas came out of the conversation, one of which was that the  
36 key message "Don't get pregnant too young" should be changed to something else".  
37

38  
39 Students felt that this kind of message was too judgmental and should instead focus on the risks  
40 of pregnancy below a certain age when your body has not developed sufficiently.  
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### 42 43 ***Support***

44  
45 Students reflected on the importance of open communication in school and with family, friends,  
46 peers and teachers. The role of teachers in delivering healthy lifestyles for healthier future  
47 families was considered important.  
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50 'We also talked about how access to contraception was important to talk about in relation  
51 to this topic as well as communication between the young person and family, friends,  
52 parents and teachers.  
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55 We talked about how sometimes it can be easier to talk to a figure like a teacher about  
56 these things than it can be with your parents. Lots to think about in there.'  
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## **Challenges**

It was considered important by students not to be judgmental or create stigma about young people who have a baby and cannot breast feed.

‘We also talked about the breastfeeding script. I talked about how I had reflected their reluctance to judge or add to the stigma/stress around mothers who can't breastfeed for whatever reason, by starting off focusing on the mental health benefits and then saying these are the facts around breast milk.’

## **Innovation**

Students shared innovative and translatable ideas when co-producing the animated videos. They put forward ideas that they and their peers could relate to. They developed material that depicted engagement with both sexes, appreciating that the healthier future families concept needed to be shared across the board so that boys and young men share the responsibility for future healthier families. All animated video settings were determined by the students, and the scripts were fine-tuned with students' input.

‘One student had the idea that it should be set in a public space like a cafe or restaurant, so that we can talk about the stigma around breastfeeding in public as well.’

‘It was noted that as young people in school were more likely to go to house parties than high street discos and parties, so the setting for the alcohol and recreational drugs information should be in a house party, with the young person being pregnant going to the fridge to select her soft drink.’

‘Students selected a male narrator to discuss the benefits of breast feeding on the animated video, noting that both partners had an equally important role in supporting the breast-feeding agenda for young mothers.’

Feedback from the participating teacher following the development of the material was also positive.

‘We have finally sat down and seen it and they are blown away... they were really clear that they did not want it to [change] and were happy and the colours were just right’

## **Discussion**

In this paper, we have described our experience developing video-health messaging with young people, focusing on reducing the risks for infant mortality. The four key video messages, converted by students, using art, into animated video material were developed and narrated by students in conjunction with university lecturers and an NHS clinician.

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3 The work we have described in this paper, is novel. Work on the co-production of health  
4 education materials for use in other contexts in the Midlands region (Steed, 2021) has provided  
5 guidance on how we can shape the work undertaken so far for wider implementation and review.  
6 We note that where people feel valued as equal members of a team contributing to their own  
7 health (Baztan et al., 2020) positive changes and increased activities opportunities can arise for  
8 patients, with the co-production of health education materials aiding clinical recovery from  
9 psychosocial disability (Mathias et al., 2020). Strategies to tackle childhood obesity, focusing on  
10 health outcomes for the schoolchild *and* community, are steps in the right direction. Building a  
11 sense of trust, engagement and equal partnership (Hall et al., 2025), and sharing conversations  
12 about risks and knowledge, especially in socio-economically and educationally disadvantaged  
13 communities, is valuable. Using such an approach, our understanding of how better to work with  
14 young people and their families, is likely to evolve.

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18 Multiple co-design projects in health research have prioritised iterative prototype  
19 development and usability outcomes, yet few capture participants' subjective experiences of the  
20 process itself. For example, a recent study co-designing a self-management app conducted  
21 usability testing, reporting a System Usability Scale and semi structured interviews, focused on  
22 interface features and perceived usefulness, without assessing how participants felt about their  
23 roles and agency, or the collaborative development journey (Amann et al., 2020). Likewise, a co-  
24 design initiative to develop Chronic Obstructive Pulmonary Disease COPD self-management  
25 interventions reported feasibility, acceptability, and stakeholder ownership but did not include a  
26 formal measure of participants' sense of empowerment or satisfaction with the co-design  
27 process (Yadav et al., 2021) .

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30 In contrast, a small but growing body of work has examined how co-design participants  
31 experience process (Yadav et al., 2021; Pallesen et al., 2020). Pallesen et al. (Pallesen et al., 2020),  
32 for example, carried out a qualitative evaluation of healthcare professionals', researchers', and  
33 patients' experiences co-designing a collective leadership intervention, finding that participants  
34 felt genuinely listened to, were able to influence workshop agendas, and valued their  
35 co-ownership of outcomes. A community-based health service co-design study used focus groups  
36 to identify positive themes such as common purpose, strengthened relationships, and personal  
37 motivation, as well as bureaucratic barriers that impeded authentic collaboration (McGowan et  
38 al., 2024). Similar themes of empowerment and skill-building have been documented in e-health  
39 tool development and in youth well-being interventions, where young people highlighted the  
40 importance of being "heard" on equal terms to adults (Tremblay et al., 2022).

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44 In the co-development work described in this paper, we have demonstrated that young  
45 people have enjoy developing and receiving messaging, and that this was certainly the case  
46 within the school involved in this study and in other ongoing work within the region.  
47 Extrapolating from our experience in the co-production of art and science in inflammatory bowel  
48 disease (Steed, 2021), and other work on climate and environmental based sciences (Djenontin  
49 and Meadow, 2018; Baztan et al., 2020) there appears to be huge potential for interdisciplinary  
50 work, co-producing and/or co-creating health messages for healthier futures for everyone in our  
51 region and nationally.

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54 The term Arts and Health is often used to refer to therapeutic work empowering or  
55 enabling a patient group to use a creative process to relieve symptoms and stress often by making  
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3 and talking in groups, and the importance of art (making) to health and well-being has been  
4 widely acknowledged by National Centre for Creative Health (2024) in the UK. Importantly, in  
5 this study we employed the skills of an artist to give a more public and compelling voice to the  
6 lived experience of the client/target group, and to create a stimulus for conversation and  
7 dissemination of key messages. In this paper, we have sought to demonstrate how integrating an  
8 artist/designer into health messaging and clinical research, and how 'giving voice' through the  
9 arts, may be understood as empowering and important for a particular target group.  
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### 12 ***Limitations and next steps***

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15 This study describes the journey of a team that worked with a school to co-create the art-work  
16 around four key messages associated with reducing risks for infant mortality. It captured the  
17 artist's reflections on the engagement with young people in school but did not directly capture  
18 perspectives the voices of young people themselves. The authors recognise this as a limitation  
19 but felt this was an important approach to use within the context in which the study took place.  
20 A follow-up study is underway, in which new groups of young people from different schools will  
21 encounter the educational messages developed in this project. Evaluation will include focus  
22 group discussions with young people, concentrating on the content, digital media, and nature of  
23 the artwork, building on the work already undertaken with young people in the region. It is  
24 important to recognise that the generalisability of the findings is limited by involving young  
25 people from only one school. The use of purposive sampling to include young people from diverse  
26 socio-economic and ethnic backgrounds is encouraging; however, future work is needed to  
27 assess responses to the visual media among young people from other schools across the  
28 Midlands and in different regions.  
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### 33 **Conclusion**

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36 Involving young people in creating health messages was valued by the school-based steering  
37 group. Their input often differed from that of the academic team, highlighting the importance of  
38 authentic, lived experience in shaping relevant communication. This divergence underscores a  
39 key strength of participatory approaches when they question the assumptions that professionals  
40 hold and improve the relevance of health messaging. The development group also noted a clear  
41 visual distinction between the co-produced content and conventional NHS materials. They are  
42 now exploring whether this difference enhances reach and impact. The process successfully  
43 engaged young people in both content creation and critical reflection on health communication.  
44 It also highlighted the valuable role of artists and designers in message delivery. Most importantly,  
45 it affirmed young people's capacity to guide creative decisions. The next step is to evaluate  
46 message uptake and impact across wider settings.  
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### 50 **Competing interests**

51  
52  
53 The authors declare that they have no competing interests related to this manuscript.  
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For Peer Review

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Figure 1. Co-developed scripts for video material.

## Scripts for Early STORK

### 1. Alcohol and recreational drugs in pregnancy

Your Baby takes nutrients from anything you eat or drink. Your baby absorbs nutrients as well as toxins from your bloodstream through the placenta.

Drinking during pregnancy can lead to miscarriages and premature birth. It can also lead to fetal alcohol syndrome which affects the development of the baby's brain and heart and has health effects later on in life. Taking drugs during pregnancy can lead to a condition called Neonatal abstinence syndrome, where the baby can go through drug withdrawal after birth. It is important to have a good support network around you. Sometimes the influence of friends or family can help you through these problems.

Choose healthy, Choose you!

### 2. Smoking During Pregnancy

One cigarette can contain over 4,00 harmful chemicals, including carbon monoxide and tar. These travel through the bloodstream, through the placenta and into the baby. Cigarettes can restrict the essential oxygen supply to your baby. As a result, their heart must beat harder every time you smoke. Smoking during pregnancy can lead to low birth weight and premature births and can cause asthma later in life.

The sooner you stop smoking, the better. But even if you stop in the last few weeks of your pregnancy this will benefit you and your baby. It is important to have a good support network around you. Sometimes the influence of friends or family can help you through these problems.

Choose healthy, Choose you!

### 3. Breastfeed during infancy

Feeding is an important time between mother and baby. It can help improve the mother's mental health and cement the mother-baby bond. It is entirely up to you whether you breast-feed or bottle feed, but the data shows that breastfeeding is better. It is recommended that newborns are given just breast milk for the first six months of their lives, then given both breast milk and other foods. Your body has everything your baby needs. Breast milk helps build the baby's immune system and protects them from some diseases. Breastfeeding can be challenging and painful sometimes. If you are having issues with feeding your baby or pain from breastfeeding, then you should talk to your G.P or midwife or health visitor.

Choose healthy, Choose you!

### 4. Being pregnant as a teenager

During our teenage years, our bodies are developing and maturing. It is important to get the timing of your baby right. If your body is not ready to have a baby, it can lead to problems delivering the baby. Just because you have your period does not mean you are ready to have and baby. Not only does your body have to mature, but your mental and emotional state as well. If you have any questions about having a baby, then you should talk to your G.P. If you are exploring sex and relationships for the first time, you should always use contraception.

Choose healthy, Choose you!

Supplementary Material A

**Alcohol Story board for the project: Reducing risks for infant mortality**



Supplementary material B: Focus group brainstorm: reducing risks for infant mortality

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No alcohol during pregnancy

Fetal alcohol syndrome

What problems occur?

Delayed growth

There would be more peer pressure, but still encourage

Learning difficulties

Hearing, eyesight problems

No smoking during pregnancy

Perhaps mention effects of secondhand smoke after baby is born too-dangerous, asthma, underdeveloped lungs

Family, friends, parents, teachers

Pain

Have a conversation about it

Contraception options

Pressure not to use it

make it apparent that it is very accessible

Flash forward to what could happen to the baby since the body is not mature enough

Don't get pregnant too young

Impact of social support systems (resilience)

Public --stigma

Reassurance

With a group

Breastfeeding

Nutrients, growth

The purpose of breast is for breastfeeding

More facilities

## Supplementary Material C (COREQ checklist)

Item No	Guide Questions/Description	Reported on Page #
<b>Domain 1: Research team and reflexivity</b>		
<b>Personal Characteristics</b>		
1. Interviewer/ facilitator	HS, TP, MA, FC, SW	Title page, acknowledgements page 21
2. Credentials	HS and MA are university lecturers with strong links to schools through projects, and were supported by the lead author who has a PhD, an MD, and is a FRCPC	Title page
3. Occupation	University lecturers, and professor of Neonatology	Title page
4. Gender	Male (artist), female (SW), Female (HS), female (TP)	
5. Experience and training	The artist FC who was contracted to develop the digital material has experience of working with young people, small groups, was an established freelance artist with DBS clearance. TP is an experienced neonatologist, clinician and researcher attached to the university and the NHS, MA and HS are experienced university lecturers with links to the school and the teacher; SW is an experienced school teacher with links to the university through University outreach work. OO is an established social health scientist	8
6. Relationship established	Yes	8-11
7. Participant knowledge of the interviewer	Participants were given information about the study in advance in group sessions (by the researchers TP, HS, MA). Participants were then invited to interview 5 artists together with the school teacher, and selected the artist they wished to work with. It was agreed at the outset that the students and school would remain anonymous. The artist was employed by the university. All parties had knowledge of each other and the artist.	8-11
8. Interviewer characteristics	The artist was selected by the students informed by the rapport they had with them at the time of interview, and their style of presentation and work	8-11

Item No	Guide Questions/Description	Reported on Page #
<b>Domain 2: study design</b>		
<b>Theoretical framework</b>		
9. Methodological orientation and Theory	Grounded theory	11
<b>Participant selection</b>		
10. Sampling	Students were Caucasian, Black, Asian and of mixed ethnicity, and came from diverse socio-economic backgrounds. One male and one female student were selected for the audio overlay of the final material.	9
11. Method of approach	Participants were approached initially on-line through a group call organised by the university, followed by on-line and face-to-face sessions with the students to develop the materials and prepare the recordings.	8-11
12. Sample size	9	9
13. Non-participation Setting	n/a	
14. Setting of data collection	school	8-11
15. Presence of nonparticipants	School teacher	9
16. Description of sample	School children in GCSE classes and the 6 <sup>th</sup> Form	9
<b>Data collection</b>		
17. Interview guide	This took the form of free discussion, preparation of story board, and sharing with students the key concepts.	10-11
18. Repeat interviews	No	
19. Audio/visual recording	Audio visual approaches were used to develop the final product	8-11
20. Field notes	Reflections were drawn from focus group discussions conducted with nine students aged 13–15 from the school-based steering group. Additional insights were gathered from team discussion notes and informal feedback collected during co-creation sessions.	8-11
21. Duration	Six months	10
22. Data saturation	No, this was not considered relevant to this project	
23. Transcripts returned	No	

Item No	Guide Questions/Description	Reported on Page #
<b>Domain 3: analysis and findings</b>		
<b>Data analysis</b>		
24. Number of data coders	2	12
25. Description of the coding tree	We identified five categories: appropriateness, partnership, being judged, realistic conversation, developing ideas. Codes were added and five themes were identified inductively. These were: reach and inclusion, knowledge, support, challenges and innovation.	11
26. Derivation of themes	Themes were manually derived as above	11
27. Software	Manually done	11
28. Participant checking	Yes, they were instrumental in the co-production of the material. Their feedback from the teacher after the presentation of the videos to them is also reported.	15-16
<b>Reporting</b>		
29. Quotations presented	These are described in the text	12-16
30. Data and findings consistent	These were consistent	
31. Clarity of major themes	Major themes are clearly described	12-16
32. Clarity of minor themes	Not applicable	