

Hwa Chong Institution (High School) Project Work

Category 4 Resource Development

FIRST AID 101

Bryan Lee Yu Zhen 4P2 (02)

Darren Ong Ye Hao 4P1 (20)

Gabriel Lee Yen Shen 4A2 (14)

Tian Shuhao 4P2 (30)

First Aid 101 Written Report

Abstract

First Aid 101 [FA101] is an intuitive, comprehensive and user-friendly resource package to educate our target audience about First Aid. Through research, we have found out that most injuries sustained by teenagers happen in school. With a lack of First Aid knowledge amongst the general populace of the school, we hope that our project can fill the void by improving the first aid skills of students. The resource consists of a website and mobile application, posters, videos and more, and educates users on the treatment of common injuries in school through comprehensive writeups, videos and quizzes. As most students own a smartphone, we believe that the project will be a success due to the accessibility of the app.

First Aid 101 Written Report

1. Introduction

1.1 Rationale

Students in Hwa Chong do not have sufficient first aid knowledge to attend to injuries, and there is an inadequate supply of comprehensive, accessible First Aid to meet this demand. This will be elaborated upon in sections 2 and 3.

1.2 Objectives

We aim to create a simple, comprehensive resource that allows users to pick up first aid easily. We aim to create a package that promotes ease of learning, and allows for the spread of first aid knowledge. We believe this will allow students to be of more assistance in times of need.

1.3 Target Audience

Our project is focused on Lower Secondary School students. We chose this group as they have less knowledge on emergency practices but are also old enough to learn these first aid techniques and execute them well enough.

Category 4 Resource Development

First Aid 101 Written Report

1.4 Resources

The resources created for this project are a website and a mobile application, along with instructional writeups, videos, posters and quizzes, among other materials. The mobile application can be installed on both iOS and Android devices.

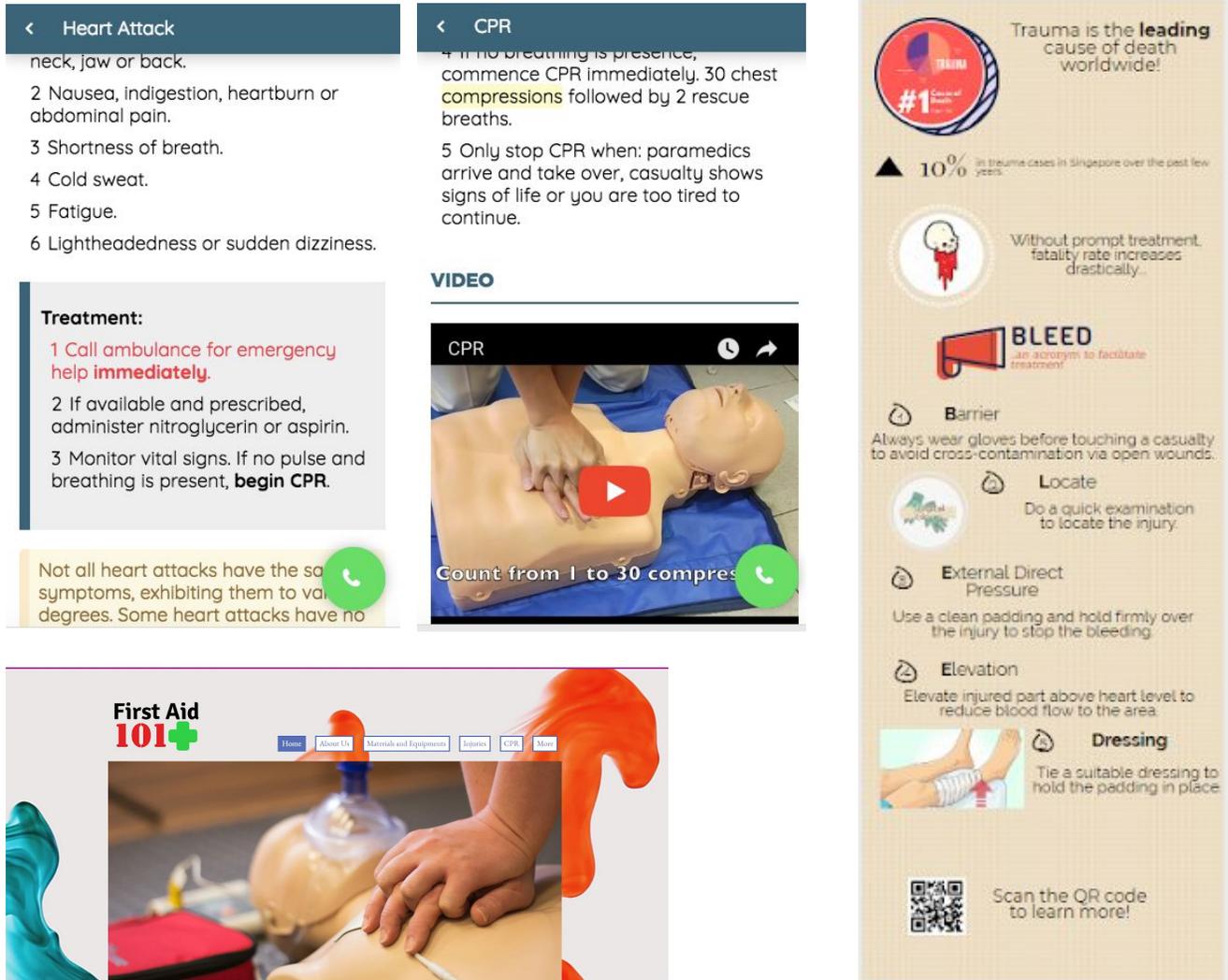


Fig 1.1. Images of our resources

First Aid 101 Written Report

2. Review

In our research, we found that there has been insufficient first aid knowledge in the general public and that this deficit is growing over time, leading to a lack of first aid knowledge in the public, especially in schools, during incidents. There has also been inadequate supply to meet the growing need for first aid knowledge, given that many of the current resources either have a price tag attached to it or, in the case of many websites, are lacking in terms of user-friendliness, concision and general ease of comprehension. Detailed research can be found in Appendix I in Section 8.1.

First Aid 101 Written Report**3. Methodology****3.1 Needs Analysis**

In Term 1, for our needs analysis, we conducted a survey on 42 HCI Secondary 2 students.

No	Question	Responses	
		Yes	No
1	Do you know what to do during an accident in school?	14	28
2	Would you like to learn basic first aid skills?	38	4
3	Do you have any first aid knowledge?	36	6

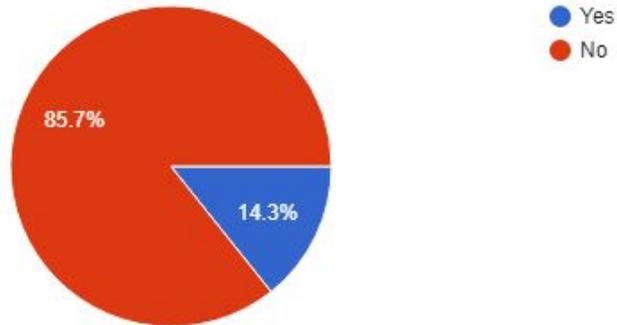
Fig 3.1. Results of the Needs Analysis.

From this survey, we deduced that most students do not possess sufficient first aid skills and knowledge, and are unsure about the appropriate responses during an accident in school. Most also indicated an interest in learning first aid. Therefore, there is a demand for our project and thus our project is relevant.

First Aid 101 Written Report

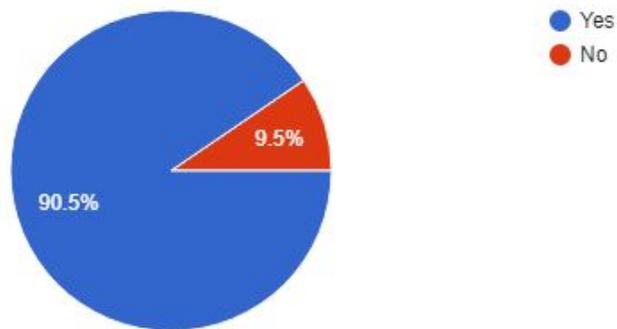
Do you have any first aid knowledge?

42 responses



Would you like to learn basic first aid procedures to help others?

42 responses



First Aid 101 Written Report

Do you know how to respond to an accident in school?

42 responses

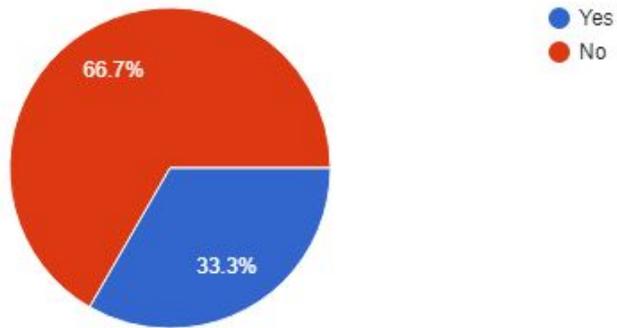


Fig 3.2. Some of the questions and results of our survey.

First Aid 101 Written Report

3.2 Construction of Resources

Most of the development occurred over Term 2 and the June Holidays. We shot multiple videos and added them to our resources. These videos allowed users to better understand the treatment of injuries, potentially improving their information retention. The website and app also contains comprehensive guides on symptoms and treatments of common injuries. Pictures and appropriate presentation were utilised to improve the understanding of users. The web application was coded from scratch primarily using Javascript with some use of Python, and testing across multiple platforms ensured the quality and consistency of products. Quizzes were added to the website to facilitate learning and ensure information retention of users. The majority of our product was completed by the end of the June Holidays. Lastly, in a bid to improve publicity, posters with nuggets of information and QR code to our websites were created. All of our First Aid information was based on reliable sources such as the First Aid Manual by St John's Ambulance Brigade as well as our own first aid training, and certified by doctors and medical students.

First Aid 101 Written Report

3.3 Pilot Test

In Term 3, we gathered a total of 40 Secondary 2 Hwa Chong Institution students. We gave 30 of the 40 students the website and the application and allowed them to conduct their own learning, afterwards, we conducted a survey with 5 questions:

1. Is the website informative? Strongly agree/Agree/Disagree/Strongly Disagree
2. Have you benefited from the website? Yes/No
3. Is the website interactive and user-friendly? Yes/No
4. On a scale of 1-10, how useful is our website?
5. Suggestions

Over 90% agreed that the website was informative, 87% agreed that the website and application was useful and 87% felt that the website was interactive and user-friendly. Over 70% rated the product at least 7 out of 10. While many students felt the site was helpful towards learning first aid, some of them felt that it was too content-heavy for them and could benefit from brevity. We followed their suggestions and made necessary improvements to our product.

As for the other 10 secondary 2 students, we gave them the resources for a week. After a week, we tested their first aid knowledge by testing their theoretical knowledge as well as judging their performance on a few simple cases and allocating scores quantitatively.



Fig 3.3. Some images from the pilot test.

First Aid 101 Written Report

Score	>70%	50%-70%	30%-50%	<30%
Theoretical Knowledge	3	5	2	0
Practical Skills	1	4	4	1

Fig 3.4 Results of the pilot test. The numbers represent the number of students whose scores fall into the corresponding range.

These results show that our product is useful and that through our product and resource, students are able to learn some necessary first aid skills and better treat anyone in need.

First Aid 101 Written Report

4. Outcome & Discussion

Our project was well received by students due to the user-friendliness and accessibility. However, we decided to extend our product by adding more features like quizzes and offline accessing, which greatly boosted the utility of our product.

There are still some limitations to our project which we are unable to overcome. There is only so much a reference resource like an application can do in terms of preparing and teaching the user First Aid, for it cannot provide the hands-on experience that an in-person course can. Perhaps the project could be improved by including an in-person First Aid course, although this will significantly narrow the reach of the project due to resource limitations.

The custom Javascript framework and library of the application is also deliberately designed to allow easy and elegant extension, not just in terms of content but also in terms of features in general. This can perhaps be used in the future to include more advanced features in the future, such as AI-powered wound identification.

5. Conclusion

Overall, this was an enriching experience as we managed to apply our first-aid skills and knowledge acquired in CCA to prepare HCI students for common accidents that may occur in school. We were also very contented with our hours of hard work and the sense of ownership was rather satisfying. However, we faced some challenges. Our mobile application runs on custom Javascript engine that require extensive coding and refining. Only one member of our group had sufficient knowledge to code for the app. This severely reduced the efficiency of our group. However, we worked around it by creating other resources. Moreover, we did not thoroughly conduct a test on knowledge of students before the pilot test, which made our results slightly unreliable. However, we will learn from our mistakes and improve the reliability of our results in the future. We also had to learn to juggle our commitments with other school work.

First Aid 101 Written Report

6. Acknowledgements

We would like to extend our deepest gratitude to the following persons/parties for their support and help, without which our project would not have been possible.

St John Brigade Singapore, for providing us with First Aid materials and other resources in the development and successful testing of our resources.

The Secondary 2 students who participated in our pilot test, for cooperating with us and helping to ensure the quality of products by giving valuable feedback.

Our mentor, Ms Wong Hong Sian, for her guidance and support throughout the project.

The judges at every stage of Project Work judging for their invaluable advice.

All the student who partook in our surveys.

First Aid 101 Written Report

7. References

Childhood Injuries in Singapore - A Review (n.d.). Retrieved July 11, 2018, from http://www.cfps.org.sg/publications/the-singapore-family-physician/article/308_pdf

Schoolboy, 12, who died after being hit by goal post was avid footballer and Man U fan (2017, Apr 24). Retrieved July 11, 2018, from <https://www.straitstimes.com/singapore/courts-crime/singapore-schoolboy-hit-by-goal-post-and-dies-in-freak-accident>

20% jump in number of accidents involving elderly pedestrians (2017, Feb 16). Retrieved July 11, 2018, from <https://www.todayonline.com/singapore/twenty-percent-jump-number-accidents-involving-elderly-pedestrians>

First Aid for Bruises. (Sep 17, 2015). Retrieved August 12, 2018 from <https://www.cprcertified.com/blog/first-aid-basics-first-aid-for-bruises>.

First Aid - Mayo Clinic (n.d.) Retrieved August 12, 2018 from <https://www.mayoclinic.org/first-aid>.

First Aid 101 Written Report

8. Appendices

8.1 Appendix I: Detailed Review and Research

There has been a clear demand for the general public to possess first-aid skills in recent years. Through our literature review, we found out that number of incidents in Singapore have been increasing. There was a 20% increase in road traffic accidents involving the elderly, from 224 incidents to 268 incidents, in 2017. The total number of fatalities in road traffic accidents, while decreasing, is still high at 122. Workplace accidents have also been increasing throughout the years. In 2016, the number of workplace incidents in Singapore jumped by a 40%. We believe that our project can help to increase the first aid knowledge and awareness of the public, limiting the damage of such events in Singapore.

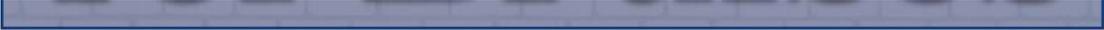


Fig 2.1. An article from the Straits Times on a fatal accident involving a schoolboy

The boy injured himself and later died of crush injuries due in part to incompetence in First Aid of bystanders. This example highlights the importance of first-aid and also the lack of trained personnel in schools.

First Aid 101 Written Report

There has also been inadequate supply to meet this rising demand for first-aid skills. While in theory, the advent of the Internet and related information technology has allowed for one to access information related to first-aid with greater ease, more often than not there are still obstacles that interfere with such access. For instance, CPRCertified.com is one site which makes available quite a wide variety of First Aid information. However, the information that can be found directly from the site is quite limited and the bulk of what it has to offer is in the form of paid courses. The site is also rather wordy and limited in terms of user-friendliness.



First Aid Basics: First Aid for Bruises

When a person falls, whether from a chair or while walking, it is likely that the individual will develop a bruise. Additionally, a person who is hit or tightly grasped by another person or is involved in an accident is also likely to bruise. Despite their unsightly appearance, bruises are not often considered to be serious injuries, and people may not seek out any type of care for them. Although they are quite common and generally not a cause for concern, there are times when bruises [may be a sign of a more serious problem](#). For that reason, bruises, like any injury, should receive proper attention and first aid. At CPR Certified, we offer online courses such as Basic First Aid and Adult CPR & First Aid. Our instructors are AHA-certified and qualified to instruct you on how to administer first aid, which includes first aid for bruises.

A part of learning how to administer first aid for bruises is understanding exactly what a bruise is and how it is formed. When a person receives an injury such as a strike, it can rupture some of the blood vessels that are located near the surface of the skin. This break releases blood that can become trapped under the skin, which results in discoloring, swelling, and tenderness or pain. Also known as contusions, bruises typically turn from red immediately following the incident to dark purple and/or

Fig 2.2. A screenshot from CPRCertified.com. Most of its content are in the form of paid courses which are promoted here. The site is also wordy and with an unfriendly user interface.

Unfortunately, this is more of the rule than the exception for online first aid resources. Our project hence hopes to provide free, open and yet comprehensive and practical first aid to anyone through our resources, and better engage the users through an interactive and user-friendly interface.