



Element H

Problem Statement

One in six women are a victim of sexual assault. Women from the ages 18 to 24 who don't have the physical means to fight back are the ones most commonly attacked. The victims afterwards then suffer mentally, physically, and financially for something that they weren't responsible for.

Introduction and Background Information

Women and people in general in today's society are too much at risk for sexual assault and abuse. This is causing a lot of people to be afraid to just walk outside of their own homes. Our research has shown that every 98 seconds someone is sexually assaulted and more than half of those sexually assaulted don't report it. In a lot of these cases, the sexual assaults can't be stopped because even if the women have something to defend themselves they can't reach it or it doesn't work. Some statistics are that an American is being sexually assaulted every 98 seconds. Out of all of these attacks over 65% are not reported due to fear or victim shaming. Just 3% of rapes result in a criminal conviction.

Test #1 - Compact/ Discrete

Purpose: One of the most important things that the ring knife needs to be is compact and discrete. The ring knife needs to be small/compact so that it can always be carried on your person. Another important aspect that we need to address is that our product needs to be hard to identify as a weapon. That way no matter where a woman is, or what she is doing, she can have our product on her in the event of an attack.

Pass/Fail Criteria: In order to test this requirement, we're going to go into a room of people and ask them how noticeable they think our ring prototype is. In order for our ring to pass this test, we want at least half of the people to just think that it's a normal ring.

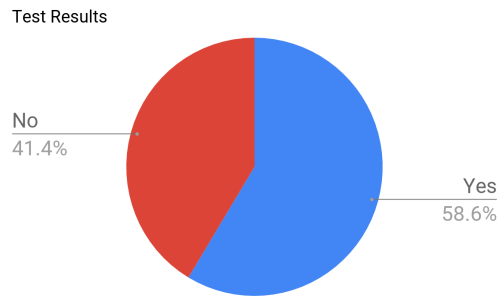
Materials needed: None.

Initial Conditions: The ring will be closed, with the cap on.

Safety Concerns: None.

Safety Test Termination: None

Blank chart for results:



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Stepwise Procedure: Collect a group of 18 students. And ask each of them if the prototype looks like a normal ring, and then if there is anything weird about it.

Test #2 - Easily Accessible

Purpose: Another important criteria that the ring knife needs to meet is being easily accessible at all times. This way no matter what position a woman is in, she should hopefully be able to reach the ring and be able to defend herself.

Pass/Fail Criteria: The ring needs to be able to have the lid removed and prepared for defense in less than 5 seconds. This will be done by three of us wearing the prototype and testing the time it takes us to remove the lid with it at varying distances from us.

Materials needed: Stopwatch, data table, and prototype

Initial Conditions: The time will start at 0 seconds

Safety Concerns: There is a potential that a testee could accidentally poke themselves with the prototype.

Safety Test Termination: If someone stabs themselves with the ring the trial will be canceled and restarted.

Data Chart:

	Trial 1- arms next to sides	Trial 2- arms above head	Trial 3- hands in pockets	Trial 4- arms stretched out	Trial 5- hands in lap	Average
Testee 1						
Testee 2						
Testee 3						
					Test average	

Stepwise Procedure: Each testee will go through five trials. When the timer person says go the tester will take the lid off the ring as fast as possible and once it is removed the timer will stop.

Test #3 - Durability

Purpose: Our product needs to be durable as well. In the event of an attack, the product should be durable enough so that the attacker cannot break the product easily. We need it to be able to withstand things such as being stepped on or thrown on the ground.

Pass/Fail Criteria: In order to test the durability of the product we need to put pressure on the 3D printed ring and see if it breaks. There is no pass or fail as the prototype is made of plastic and will most likely break. The metal prototype will not break by human strength.

Materials needed: prototype, hammer, and human strength.

Initial Conditions: the 3D printed prototype will be placed on the table and hit, stomped on ,and thrown.

Safety Concerns: someone could accidentally stab themselves, hit themselves with a hammer, or plastic shards could cut them.

Safety Test Termination: If someone is hit by something the test will be terminated and resumed later.

Data Chart:

Tests	
Test 1- hammer	
Test 2- stomped	
Test 3- thrown	
Average	

Stepwise Procedure: The prototype will be placed on the table or floor. Pressure will then be put on the ring in three ways.

Test #4 - Harmful

Purpose: The product needs to be something that can harm an attacker. The purpose of the product is to help the user defend themselves from an attack by causing harm to the attacker. The product needs to cause enough harm to get someone to back off but not enough to be lethal.

Pass/Fail Criteria: The product will need to make scratches and dents in cardboard to show it can have some harmful effects. Since this is a prototype it does not need to slash through because for safety reasons the prototype is not as sharp as the actual product would be.

Materials needed:cardboard and the prototype.

Initial Conditions:a regular piece of cardboard untouched.

Safety Concerns: potential puncture of the skin if not handled correctly

Safety Test Termination: if someone is stabbed with the ring the test will be stopped.

Data Chart:none

Stepwise Procedure: a sheet of cardboard will be held up. Someone will take the ring and slash the board in multiple directions and stab a different piece to show whether it has harmful capabilities.

Conclusion

The tests for the prototypes consisted of testing for compactness, accessibility, durability, and harmfulness. This set of criteria was tested due to the problem of sexual assault. In the event of a sexual assault women need to be able to easily and quickly reach for something to help them. This needs to be something that can't be taken away from them and that can help them fight back. The prototype is expected to meet all these criteria due to it being designed based upon these requirements. It needs to be discrete, be accessed in seconds, unbreakable, and it can cause harm without being lethal.

In the design requirements, two were not tested. These were in-expensiveness and easy to use. These were not tested because the other requirements were more important to a women's self-defense. Additionally those two criteria can be determined through the building of the prototype as well as they don't have specific values that can be tested. The next step is to conduct the test and conclude results.