Concept Paper

Research Writing

Submitted By:

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**Title:**

Biometrics: Fingerprint Authentication / Touch-Sensitive Display in Smartphones to people with Palmar Hyperhidrosis (Sweaty Palms) in Metro Manila

**Keywords:**

Palmar Hyperhidrosis, Fingerprint Authentication in Smartphones, Touch-Sensitive Display in Smartphones

**Short Title:**

The use of Smartphones to people with Sweaty Palms

**Rationale:**

The teams research will be about the user experience of a person with palmar hyperhidrosis when using a smartphone. The team found the topic interesting because a member of the team (who is self-diagnosed with palmar hyperhidrosis) experiences the everyday struggles of using a smartphone, specifically the smartphones’ touch sensitive display. Also, the existence of waterproof and water resistant smartphones in the market that doesn't function well when wet made the team curious.

The current trend in smartphones, fingerprint authentication dramatically increased the level of security that one phone has, but another current trend in smartphones namely water resistance somehow revealed the flaws of the fingerprint authentication. The team wanted to weigh the pros and cons of the fingerprint sensor failing to authenticate when the finger is wet and to inform future smartphone producers feedback from people with palmar hyperhidrosis in order to hone the future smartphones.

**Background of the Study:**

Smartphones are hand held devices that functions like a computer. They can receive and make calls, create and receive messages, also, these smartphones has the capability to connect to the internet, making them capable of downloading and running 3rd party apps (downloaded from digital distribution platforms such as Google Play and App Store). Smartphones are first introduced in 1999 by the japanese company NTT DoCoMo, and became widespread a year after. A lot of firms have been competing in the Smartphone Industry, and the competition never stops, every year, new features and innovations were introduced.

This 2016, new features such as fingerprint authentication and water and dust resistance surfaced. Fingerprint authentication revolutionized security, while water and dust resistance dramatically enhanced durability.

**Research Questions:**

1. How would people with palmar hyperhidrosis utilize the functions of their smartphones namely the FINGERPRINT AUTHENTICATION and the TOUCH-SENSITIVE DISPLAY?

**Objectives:** This research aims to study the user experience of people with palmar hyperhidrosis when using their smartphones. It is to inform the general public about the user experience of those with palmar hyperhidrosis and their smartphones, so that they may use it to increase and make considerations when interacting with people with palmar hyperhidrosis. Thus the objectives are:

1. to help people with palmar hyperhidrosis on how they would utilize the touch-sensitive display and fingerprint authentication features of their smartphones.
2. to help smartphone manufacturers to look for ways on how they would broaden their satisfied market by knowing the complaints and statements from people with palmar hyperhidrosis.

**Theoretical Framework:**

* **Palmar Hyperhidrosis –** a medical codition wherein the person affected experiences excessive and uncontrollable sweating in the hands.

**Sulzberger and Herrmanns Electric Gradient Theory** They observed a reduction in the flow of sweat in volunteers who had malaria induced by iontophoresis. They hypothesized that iontophotesis disturbed the normal movement of sweat along the sweat duct making sweat incapable to flow.

**Plug Theory** Several authors studied miliaria rubra induced by iontophoresis noted the formation of Schiff-Positive, diastese-resistant material (plugs) in the lumens of eccrine sweat glands. They said that sweating inhibited through mechanical bloackage of sweat at the level of the stratum corneum, the depth and severity of obstruction being dose related. (Redder and Luedders)

**CREB Protein Mutation is the cause of Hyperhidrosis** (O'Callaghan, 2016)The dephosphorylation of CREB Accelerates at times of stress.

* **Fingerprint Authentication in Smartphones**
* **Touch Sensitive Display in Smartphones**

**Conceptual Framework:**

**Scope and Limitations:** The researchers are focused on observing the people with palmar hyperhidrosis that uses a smartphone. The study will be conducted within Metro Manila only.

**Definition of Terms:**

The definition of words to be used in this research is defined by the following:

* Palmar Hyperhidrosis – The medical condition wherein someone has excessive and uncontrollable sweating in the hands.
* Iontophoresis – technique of introducing ionic medicinal compounds into the body through the skin by applying electric current.
* Miliaria Rubra – crops of tiny red bumpy spots, caused by the blockage of sweat ducts on the outer layer of the skin.
* Eccrine Glands – the only true sweat gland in humans.
* Stratum Corneum – the horny outer layer of skin.
* Dephosphorization – the removal of phosphate from an organic compound via hydrolysis (breakdown of compounds due to reaction with water).
* CREB (cAMP response element-binding protein) – binds to DNA sequences that increases or decreases the transcription of downstream genes.

**Methodology  
- Research Design** This study will be a descriptive research regarding the User Experience of people with sweaty hands when using their smartphones. Focusing on their user experience on the smartphones’ touch sensitive display and fingerprint authentication.

**- Respondents of the Study:**   
 The respondents of this study would be people with sweaty hands and smartphones that live in Metro Manila

**- Research Instruments** The researchers will use will use 3 instruments in order to gather data from our respondents namely, Iodine-Starch test, written questionnaires, and a semi-structured interview. For the questionnaires, 2 types will be used, a written and a virtual one, the virtual questionnaire will be administered via Google Forms while the written one is administerred via paper and pen. And to further support our research, we will also study other researches made related to our topics from secondary sources such as google and EBSCO Host.

**- Procedure** The researchers will choose people with Palmar Hyperhidrosis within Metro Manila. These people then will be given 2 questionnaires (it can be written or virtual), one for the diagnosis of palmar hyperhidrosis and another one for the user experience regarding their smartphone usage, a fraction will be chosen to do the Iodine-Starch test, and some will be invited for a semi-structured interview.

- **Statistical Treatment** The researchers will process the data gathered from the answered writted questionnaires by computing for its mean, median, and mode in order to find out the standard deviation. The researchers will also use a pie chart indicating the percentages of the general data.

 FORMULAS:

Mean: Median (Odd):



Median (Even):



Standard Deviation:

Where μ = mean

X1 = are individual values

Percentage:   
Where % = Percent

f = Frequency

n = number of cases

CREB Protein Mutation Theory

Plug Theory

Electric Gradient Theory

Causes

Palmar Hyperhidrosis