

Mobile application for identification of Münchhausen Syndrome by proxy for the contribution of forensic nursing*Aplicación móvil para la identificación del Síndrome de Münchhausen por poder para la contribución de la enfermería forense**Aplicativo móvel para identificação da Síndrome de Münchhausen por procuração para o aporte da enfermagem forense***Alessandra Andréa da Silva Tetzlaff¹**

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How to cite this article:

Tetzlaff AAS, Gomes JA. Mobile application for identification of Münchhausen Syndrome by proxy for the contribution of forensic nursing. Glob Acad Nurs. 2020;1(3):e59. <https://dx.doi.org/10.5935/2675-5602.20200059>

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Chief Editor: Caroliny dos Santos Guimarães da Fonseca
Executive Editor: Kátia dos Santos Armada de Oliveira

Submission: 12-02-2020**Approval:** 12-18-2020**Abstract**

The Münchhausen Syndrome by proxy, currently classified as Factitious Disorders imposed on another, has the characteristic of simulating and defrauding signs and symptoms to remain in the sick state, and thus provide secondary gains for you or the perpetrator. Framed as violence against children and adolescents, its diagnosis is based on the guidelines of pathological exclusions and the unpreparedness of health professionals in their prior identification, favoring underreporting to the responsible bodies. As a general objective it is proposed to explain about the construction of a computerized tool to be used to support the decision of the forensic nurse in his work practice, named SISMUN. It is a study of a basic nature, a qualitative approach with a descriptive-exploratory technical process and technological methods for the construction of the ontology and usability of the mobile application. As a result, a responsive WebApp was built on the restricted site <sismun.app.br>, free access, with a database and generator of the final report of the materialization of the nurse's consultation in the case of suspicion, in the possibility of identifying this type of disorder.

Descriptors: Münchhausen Syndrome Caused by a Third Part; Forensic Nursing; Mobile Apps; Child Abuse; Clinical Decision Support.

Resumen

El Síndrome de Münchhausen por poder, actualmente clasificado como Trastorno facticio impuesto a otro, tiene la característica de simular y defraudar signos y síntomas para permanecer en el estado de enfermedad, y así proporcionar beneficios secundarios para usted o el agresor. Enmarcada como violencia contra la niñez y adolescencia, su diagnóstico se fundamenta en los lineamientos de las exclusiones patológicas y la falta de preparación de los profesionales de la salud en su identificación previa, favoreciendo el subregistro a los órganos responsables. Como objetivo general se propone explicar sobre la construcción de una herramienta computarizada que sirva de apoyo a la decisión del enfermero forense en su práctica laboral, denominada SISMUN. Se trata de un estudio de carácter básico, un abordaje cualitativo con un proceso técnico descriptivo-exploratorio y métodos tecnológicos para la construcción de la ontología y usabilidad de la aplicación móvil. Como resultado, se construyó una WebApp responsive en el sitio restringido <sismun.app.br>, de libre acceso, con una base de datos y generador del informe final de la materialización de la consulta de la enfermera en caso de sospecha, en la posibilidad de identificar este tipo de trastorno.

Descriptoros: Síndrome de Münchhausen Causado por un Tercero; Enfermería Forense; Aplicaciones Móviles; Abuso Infantil; Soporte de Decisiones Clínicas.

Resumo

A Síndrome de Münchhausen por procuração, atualmente classificada como Transtornos factícios imposto a outro, tem como característica simular e fraudar sinais e sintomas para permanecer no estado de doente, e assim prover de ganhos secundários para si ou para o perpetrador. Enquadrada como violência infanto-juvenil, seu diagnóstico paira nas diretrizes de exclusões patológicas e despreparo dos profissionais de saúde na sua identificação prévia, favorecendo a subnotificação para os órgãos responsáveis. Como objetivo geral propõe-se explanar sobre a construção de uma ferramenta informatizada para ser utilizada como suporte a decisão do enfermeiro forense em sua práxis laboral, nomeada SISMUN. Trata-se de estudo de natureza básica, abordagem qualitativa com processo técnico descriptivo-exploratório e métodos tecnológicos para a construção da ontologia e usabilidade do aplicativo-móvel. Como resultado, foi construído um *WebApp* responsivo no sítio restrito <sismun.app.br>, acesso gratuito, com banco de dados e gerador de relatório final da materialização da consulta do enfermeiro frente ao caso de suspeita, na possibilidade de identificação deste tipo de transtorno.

Descriptoros: Síndrome de Münchhausen Causada por Terceiro; Enfermagem Forense; Apps Móveis; Maus-Tratos Infantis; Suporte à Decisão Clínica.



Introduction

The use of technology in our society is occupying an increasing space. Time to enable greater human-machine interaction in the construction and popularization of knowledge; time, to enslave the subjects' time and quality of life in the search for human survival, recreating social experiences. Given this, its existence in the social transformations that space has been suffering from technological advances, especially mobile devices, and the internet, is undeniable. Technology is so present in human life that it makes it difficult to define the limits between man and machine.¹

Nowadays, both print and digital media have been widely used to strengthen social relationships and materialize the information that is to be propagated, as a form of communication. Thinking about social communication, is associated with Psychology, due to the interrelation between cultural construction and subjectivation processes.²

The subjectification process "is a relationship between who we are ceasing to be and who we are not yet", that is, it is found in the gap between the subject constituted by the identities established between the relationship between knowledge and power and naturalized by the subject, with how the attempt to stop living the way one lives in search of the constitution of another style of existence. Therefore, it presupposes the conversion of the look that seeks to get rid of the objectifications that produce negative population identities.³

This new look promotes new paradigms in search of the subject's survival in psycho-affective, cognitive, and moral dimensions, according to Michel Foucault's theoretical contributions⁴. For him, modern men are constituted as such in processes of subjectivation and objectification, insofar as they establish their daily relationships, in which they live, produce, and express a true discourse.

Nevertheless, technology contributes to recreate this speech at an accelerated pace, accompanied by enchantments, benefits, possibilities and threats. In view of the convergence of languages, interrelation, interactivity and multimodality, man-machine-media-man relationships evolve.¹

Getting to the point that the simple act of telling stories in the form of narratives that accompanies since the dawn of humanity to preserve memory, disseminate knowledge; shares the culture; exercises religiosity and prestige; promote entertainment; express your emotions and impressions; gains resources beyond orality, enriching the narratives and involving the narrator and spectator in sensory experiences, enabling human development.^{5,6}

The same story can be told in different ways, with different approaches and resources, often, the role of the storyteller goes beyond the pleasure of telling and listening, acquiring an important cultural and social function, and the result of his choice will certainly influence consequences. There is, therefore, an important psychic function in storytelling that is linked to desire, the listener's impulse to

follow the story to know what will come next, whether false or true, simply to sensitize.⁵⁻⁷

We will then have the lie as part of the real process of your storyteller, a tool available, easily accessible and that there is no financial cost⁸. In the health area, it is no different. We tell the story of our life, of our complications, of our illness. It is hoped that this communication will establish relationships that are convincing in the construction of signs and being the author of your own world, however, lying is part of the cognitive process and in obtaining some benefit.

The habit of lying becomes a personality disorder and is not always detected by health professionals, and which unfortunately can be underdiagnosed and delay more and more its effective treatment for health promotion. Although it does not consist simply in telling some isolated lies, the post-truth constitutes a consecration of the lie in the plural, a regime of deregulation of misrepresentation, which capitalizes on the multifaceted character of the lie in our daily understanding and instrumentally multiplies it under media forms.⁹

Disease fraud affects anyone, of any age and social class. There are historical reports of the types of simulation, induction or pretending of diseases in soldiers and sailors with psychiatric follow-up due to suspected impostor behavior, mainly of the information obtained about symptoms, prevailing visual problems, fever, and induction of convulsive crises. In 1908, doctors Paul Georges Dieulafoy and Paul Bourget named the term Patomimia, due to the simulation and mythomania presented during the observation of a psychiatric patient with a compulsion to lie, leading him to suggest a picture of behavioral disorder.¹⁰⁻¹²

Almost five decades later, Dr. Richard Alan John Asher observing a group of patients who promoted self-harm to remain in the infirmary of the alienated. Thus, he suggested a new name, the then syndrome, referring to the famous liar baron of literature, naming him as Münchhausen Syndrome.¹²⁻¹⁵

After two decades, another variation of this disorder was described in the medical literature in 1977 by the pediatric nephrologist Dr. Roy Meadow, as a rare form of child abuse, being named as proxy Münchhausen Syndrome (SMP), defined as a situation in which child is brought to medical care due to symptoms or signs invented or caused by their legal guardians, family members or caregivers. He distinguished a situation in which the child often had symptoms of illnesses that were not diagnosed by the medical staff as a standard illness. He suggested adding in the name previously given by Ascher, the term "by proxy", which is widely used in the legal field because it means giving him full powers, that is, the adult has power over the child in his care, making it to as the object of your need.¹⁶

Corroborating, a study¹⁷ stated that SMP is provided through illnesses inherently invented by someone close, inducing the victim to various medical procedures. He comments that the incidence above 80% among mothers and children is not by chance, since the role of caregiver, by society, is borne by the maternal figure. Emphasizes that the symptoms and indications of diseases interrupt when the



child is separated from the one who causes this clinical picture.¹⁵

Currently, MS is defined by the International Statistical Classification of Diseases and Health-Related Problems (ICD-10)¹⁸ as factitious disorder and other syndromes, it includes in T74.8, as mistreatment, where the patient simulates signs and symptoms to need medical attention, to assume the role of the sick. Its diagnostic criteria range from single or recurring episodes to differential characteristics in 4 patterns: A- patient invents psychological and physical signs, induces injuries or illnesses; factitious disorder; B- the individual presents himself to others as sick, incapable, or injured; C- patient with evident fraudulent behavior even in the absence of obvious external compensation; D - the behavior is not well explained by the disorder, such as delirium or another psychotic condition. And SMP was recognized as a behavioral disorder by the area of psychiatry obtaining the classification 300.19 in 1980 in the DSM, when it was inserted only after its third version.¹⁹

According to the APA (1995), the criterion for the diagnosis of this factitious disorder is the intentional production of physical or psychological signs and symptoms, without the patient getting anything in return, such as financial gain or release of legal responsibility, improvement of physical well-being or use of certain medications, only attention to playing the sick.²⁰

It is evident that the focus in this action is to be and remain sick, and the production of conscious symptoms is one of the contributions to the diagnosis of SM or SMP, however there are other comorbidities that often hinder the diagnosis of the syndrome, leading the professional to confusion in identification. One factor to be analyzed is the history of deprivation, childhood abuse, neglect, illness, outpatient, and hospital admissions: thus, characterizing one more nature among the types of violence. Another factor is the difficulty of identifying this form of abuse early, since in most medical services the frontline professionals are nurses, who must be sensitized and prepared to identify early.^{15,21-24}

Corroborating with these premises:

Thus, the nurse is in a unique position to detect and evaluate patterns of violence, due to being the professional responsible for the initial reception and working with the patient (victim) / aggressor or family 24 hours a day, calling them first-class professionals.²⁴

But this does not always happen, several factors can be listed as complicating or deviant, such as, ignorance about this type of disorder, the inexperience of the professional, the incipience of protocols for identification, involvement with legal issues, in addition to fear and diagnostic error.^{15,21-23} And to promote effective patient care, the professional's perception must be refined to be able to collaborate with the multidisciplinary team and other areas related to health.²⁵

However, a new specialty for nursing has emerged in the health professional field, forensic nursing, which in Brazil has been legally recognized since 2011. The need for creation is that it can contribute to this area, considering that the human being in its various dimensions of weaknesses related to the environment, it recognizes its needs in search

of the truth from a humanitarian perspective. And it has the capacity to serve the population in particular; providing support, reception, security, care, respect, in addition to the care planned and guided by public policies and based on theories of nursing, which interchange with the guidelines and legal contributions of justice.^{23,26}

Given the difficulty in identifying SMP, this study aims to explain about the construction of a computerized tool to be used to support the decision of the health professional, especially the forensic nurse, about the possibility of occurrence of the factitious disorder imposed on the other in their work practice. It aims to address from the identification of signs and symptoms, the characteristics and interfaces involved, as well as the approach to the patterns of factitious disorder and its process of falling ill, in addition to the ontology of the construction of the mobile application.

Methodology

It is a study of a basic nature, qualitative approach with a descriptive-exploratory technical process, through bibliographic review supported by scientific bases of primary and secondary information sources.

The sources of information used were articles from journals, theses and dissertations, which include the inclusion criteria established as: complete documents, available in scientific repositories with free access to their collection, in the period of data consultation between 2000-2020, with descriptors to search the directory for the terms: "Munchausen syndrome by third parties", "Münchhausen syndrome by proxy", "factual disorder imposed on the other"; as well as the Boolean terms (and., or). In addition, specific sources of information about software, data mining, user interface design in several reliable documents for the chosen theme. As complementary inclusion criteria, only free access content, in Portuguese, English and Spanish, available in full. For the exclusion criteria, the selected and replicated information sources were considered as a unit for the analysis of the results.

The grounded theory of data - TFD was used, as it consists of the construction methodology inductively to bring new knowledge to the defined subject, based on the contribution of the interpretative and systematic framework. The choice of TFD for this study was due to the characteristics of freedom and flexibility, allowing the emergence of concepts, that is, the meaning of this freedom is not to reject previous knowledge and external advice to study the proposed subject, but to focus on what it matters, taking into account the generation of a theory that explains patterns of behavior, and being open to what is happening in the substantive and correlated area, while allowing awareness about what the study will be.^{27,28}

And finally, the presentation of the results are shown by conceptual categories emerging from the substantive encodings for the process of building the proposed mobile application ontology.



Results and Discussion

In this construct, it was possible to constitute two main defined categories: Content Ontology and the Construction of the Application, which will be explained during the presentation and discussion of the results.

Content Ontology

The term ontology has its origin in philosophy, one of the branches of metaphysics, which examines the fundamental nature of reality including the relationship between mind and matter. In this context, information technology attributed to a description of concepts and relationships that were considered by one or a group of agents. Therefore, for this study it was used with the approach of presenting a means of classifying the concept of SMP in its complexity.²⁹

In the bibliographic survey carried out, I cite as a key point a research carried out in 2009 that evaluated 42 cases made available on the internet, 21 of which were reported as suspicious and 21 confirmed cases for SMP. For this analysis, artificial intelligence tools of data mining were used, whose initial purpose was to obtain the grouping of attributes to compose classes (concepts) that are abstract groups, sets or collections of objects (data). After the first mining, 56 attributes were found, subdivided into the four classes formed: DISEASE - 18 attributes, FAMILY - 10 attributes, CHILD / TEENAGER - 08 attributes, CAREGIVER - 20 attributes, allowing a broad view of the behavior and simulation characteristics of this type of disorder factitious.³⁰

In summary, the characteristics of each class are equivalent:

- Disease with the attribute of strange, rare, unexplained, prolonged. With inconsistent data, with a predominance in the presence of the caregiver, signs and symptoms change without plausible explanation. Presence of fever, blood, vomiting, diarrhea, apnea, and seizure are reported with a predominance of fraud.
- Family is distant or silent, as they believe in the caregiver's action, they may have cases of sudden or unexplained death and visitation is rare.
- Child or adolescent ends up being complicit with the situation, because he wants the caregiver close to invest in the performance of the patient, because he believes in the guidelines of the adult who is normally a family member.
- Caregiver appears to be articulate, knowledgeable in technical terms in the medical field, friendly and communicative. Always willing to help the nursing team, invests in a cordial or intimate relationship with the

medical and assistance team, has theatrical aptitude and changes behavior when contradicted. You exercise power with the child, but you may not be concerned about it, prefer invasive procedures and be the center of attention. Avoids leaving the child, tends to exceed limits and likes to be recognized as an experienced caregiver.

Then, based on the classes and their attributes, dynamics were developed using the UML use-case diagram tool, as shown in Figure 1, which represents the three scenarios.

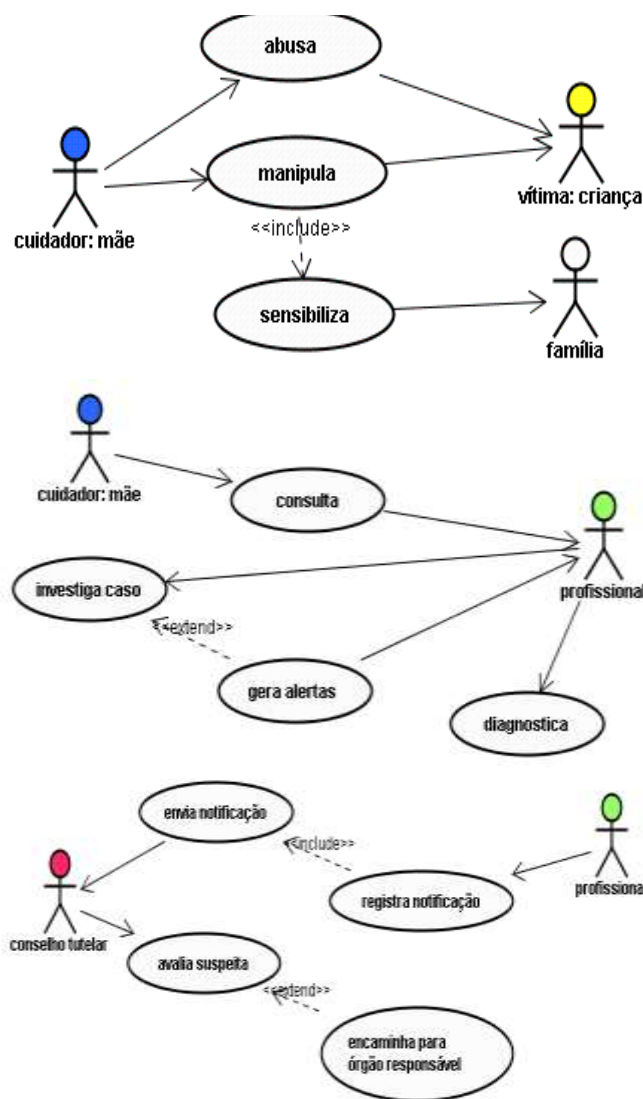
Scenario 1 - It represents the caregiver (mother) who manipulates the signs and symptoms in the child (victim) in his family environment, using some type of violence; thus, it sensitizes the other members of the family, in which they believe that the caregiver is doing the best for the child.^{30:105}

Scenario 2 - This of greatest interest for decision making is represented by the caregiver who accompanies the child to the consultation with the pediatrician. For this consultation, there is a tendency for consultants to choose newly graduated doctors, as it facilitates the manipulation of the consultation progress in their favor. In general, only the caregiver reports the story while trying to control and monopolize the conversation for his own attention and the child reacts dependent, conniving, and convincing to the reports. At that time, the professional will investigate the reported information and plan a treatment to analyze the veracity of the facts mentioned, being attentive to the possible signs and symptoms that may suggest SMPP. However, in these attempts to justify the report, the child will inevitably undergo various medical procedures, some of which will be invasive, thus characterizing the form of conniving physical abuse previously mentioned.^{30:106}

Scenario 3 - When there is a suspicion of violence, it is mandatory to fill out the notification sheet and forward it to the tutelary council by the health professional, who in this case is the doctor. The Tutelary Council will analyze the suspicion and forward a report to the competent bodies (legal, criminal, civil), which will define whether the caregiver will undergo psychological, drug treatment or possible social exclusion (penitentiary). Regardless of the final report, when suspecting some type of child abuse, the aggressor (mother) should be removed from the victim (child) to avoid further worsening of the clinical condition.^{30:106}



Figure 1. Diagram of SMP UML use cases. Campeche, Mexico, 2020



Source: Tetzlaff.³⁰

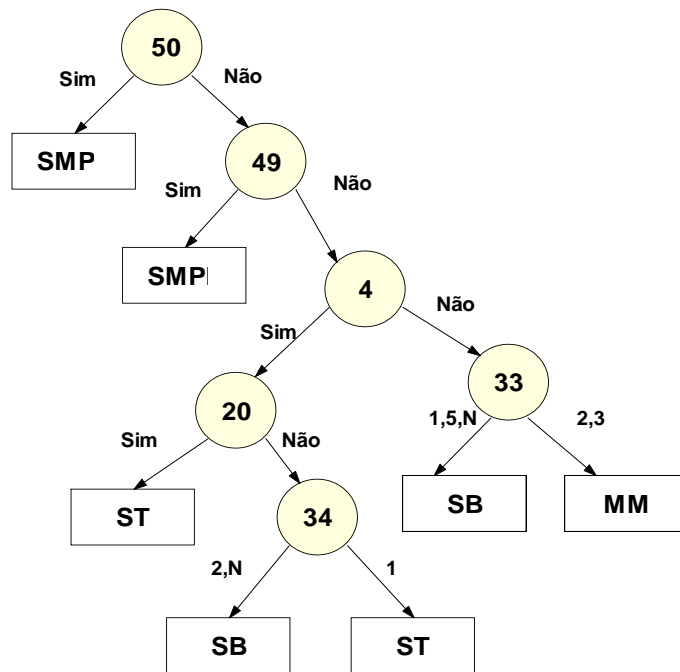
It is possible to perceive through the analysis of the scenarios, that the nurse is in a privileged situation to analyze and suspect the possible occurrence of child abuse; however, it must be sensitized and trained for this complexity of diagnosis by exclusion. For this, the need to use standardized protocols for decision making, adds the action of the forensic nurse in which he must investigate the information that is provided and verify the veracity of the facts that are presented, so that together with the multidisciplinary team, the pursuit of justice and victim protection.

However, these attributes raised can be confused with the dynamics of other mental disorders, such as Tourette's Syndrome (ST), Bordeline Syndrome (SB) and Moral Masochism (MM), according to the data collected from the selected scientific articles. As described by a research, used as a second moment, a decision tree generator as a data mining tool - C4.5, in the 42 published

and refined case studies in the 56 attributes raised, the differential decision nodes were found by characteristic of each pathology mentioned.³⁰

As shown in Figure 2, the attributes 50 - 49 - 04 - 20 - 33 - 34 are the nodes of the decision tree by binary response. In this case, if we have the answer YES (present) in attribute 50 (caregiver curious in the form of treatment of the disease) it is indicative of SMP, however if it is NO (absent), it needs the complement of attribute 49 (caregiver curious in the evolution of the disease)) to confirm this indication. However, if the answers are negative in attribute 4 (repeated illness) and in attribute 33 (education level - 1st childhood) together, they become indicative for BS. It is already different if attribute 4 (repeated disease), added to attribute 20 (family believes to be zealous caregiver) are positive, are indicative for TS; if attribute 20 is NO, and attribute 34 (gender - female predominance) is YES, both confirm the indication for ST. And so on.

Figure 2. Decision tree generated by C4.5 for diagnosis of mental disorders. Campeche, Mexico, 2020



Source: Tetzlaff.³⁰

Of the 42 cases analyzed, it was already known that 50% (21+) were diagnosed for SMP, when submitted to miner C4.5 demonstrated that 20 cases remained certain, only 01 cases were considered uncertain for diagnosis. However, the other 50% (21-) who were remarkably similar cases, but diagnosed with other mental disorder pathologies, pointed out 10 cases for BS, 05 cases of certainty for ST and 02 uncertain cases, and only 04 cases were identified like MM.

These cases of uncertainty depend on the SB due to the similarity of the answers, which is equivalent to the margin of error 7.1%.³⁰ Finally, this analysis confirmed the necessary attributes to identify the complexity of the SMP, and thus enable the grouping of the information generated to compose a tool that could assist the professional nurse, based on his forensic vision for decision making.

Building the Application

Based on the information gathered, the construction of diagramming screens and the creation of a presentation flowchart for the prototype of the mobile application proceeded. This phase permeated the human-system exchange because it encompasses the interdisciplinary fields of interaction design and information architecture, modeling the prototype with a way of expressing itself through semantics, consisting of causal diagrams and stock diagrams to compose the navigation flow for visual communications designed to efficiently convey the specific messages proposed.^{32,33-35} Figure 3 shows the prototyping built by the wireframed drawings of the screens. Although the choice of the matrix color was red, saturation (chroma) and brightness (luminosity) were used for the monochrome to be obtained, through the harmony of the visual perception of the user about neural assimilation.^{34,35}

Figure 3. Wireframes of the SMP application prototype. Campeche, Mexico, 2020



For the icon, it was proposed to develop a context to synthesize the attributes in the SMP identification, emerging the idea by the semantics of the data junction, constitutes the formation of the individual who can bring out the violence affected by the SMP, is based on the composition of an interaction.

The typography used to compose the application were Audiowide Pro, Nexa Light and Nexa Bold for projecting balance and harmony between colors and proposals, legibility for having a good distinction between glyphs, in addition to the adaptability on the screen.

We chose to build the software, a set of components that were partially ordered with the following main tools: Progressive Web App, Android Application Pack, JAVA / ORACLE, Trusted Web Activities, HyperText Markup Language, Personal Home Page, Structure Query Language, Cascading Style Sheets, Bootstrap.

The name SISMUN refers to the Münchhausen Syndrome Identification System by proxy, an incorporation made into the system was automatic translation into multi-languages, the initial choice was for Spanish and English, in addition to native Brazilian Portuguese.

Figure 4. Multi-language registration interface. Campeche, Mexico, 2020



The steps for executing the prototype system initially refer to the professional's registration with password generation for login and data security, after performing the patient's registration to proceed with the consultation itself, basically the user must answer 10 objective questions, being unvalued (multiple choice) or multivalued (check box) for measuring responses and finalizing the consultation. The cut-off pattern for diagnosis in the prototype corresponds to three possible diagnoses: Characteristic for SMP (≥ 80); Suspicion for SMP ($\geq 60 - \leq 79$); Not characteristic for SMP (≤ 59).

At the end of the consultation, the database is shared (DB) to save the consultation and print the final report that can be attached to the patient's medical record and used as a supporting document in cases of suspicion or confirmation, which according to the law any form of violence must be notified to the competent bodies.

Currently, it is available for free to the end user on the WebApp <sismun.app.br>, as its development was for android smartphone and website, allowing a good system responsiveness. It has SSL certificate, active domain registration active, hosting on an internationally recognized

server, in addition to having the registration certificate under No. 610144526, legally recognized in the 178 signatory countries by the Berne Convention which is managed by the World Intellectual Property Organization itself.

Conclusion

In recent years, the forensic sciences have been strengthening every day, in a wide, intricate and meaningful space, therefore, it is considered that the forensic sciences is not a single science, it is the junction of several areas that use their knowledge, methods, scientific techniques to elucidate the investigations of the phenomena, being in constant transformation, improvement and innovation.

Currently, nursing has been monitoring progress in the areas of care and in the dynamics of the health-disease process, as well as changes in human behavior. It was noticed that there are new forms of violence committed in society, where its apparatus is increasingly refined, to make it difficult to reveal authorship. Therefore, there is a need to prepare these professionals to deal with any forms

presented. Nevertheless, the nurse must act in the priority sense of “taking care” of the patient but can complement his assistance in favor of the current justice system, filling the gap between the provision of quality health service, with the collection and preservation of information. evidence that will support legal processes.

The look in the forensic context must go beyond appearances, beyond precepts, concepts, and prejudices, beyond superficiality, beyond our understanding of humanity. This is the key to the enigma of forensic nursing, acting in an interdisciplinary way, bridging the gap between the victim of violence and justice, combining technical-scientific knowledge with holistic complexity for law enforcement, even after being postmortem care, either extra or in-hospital.

Concomitant to these reflections, situations of violence have occurred since the beginning of human life, but it was around the 19th century that mental illnesses were correlated with the established moral view, with fraud as a point to be studied and considered as a differential. Münchhausen Syndrome - SM, today considered a factitious disorder, comes to confront the concepts of the individual seeking a cure, not the disease. To keep yourself sick, you increase the occurrence of fraud, simulation, manipulation,

adulteration of signs and symptoms to obtain some secondary gain for yourself or use a third party for that.

Due to the complexity of the dynamics of MS in covering up the hoax, the nurse can be unconsciously conditioned to act in collusion with the situation of manipulation, being framed as forms of violence affected. Worrying when it involves children, who due to their vulnerability can suffer the biggest data. Another factor to be considered is the incipience of standardized protocols for the multidisciplinary team, in search of a more accurate and safe diagnosis of this farce.

In this way, this study demonstrated the creation of a mobile application, easy to access and free to be used by nursing in the materialization of the observations in the form of a report on the factitious disorder imposed on another, and that up to the present day, it is not possible to obtain the statistical concession on the real prevalence of PMS, mainly due to the failure of identification and notification of health professionals in their expertise.

Like any other study, this construct is not intended to end here, which is why the scientific community offers the SISMUN mobile application, with the intention of subsidizing the view of forensic nursing in child and adolescent health care, perhaps to be used as a tool teaching-learning of this type of violence.

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