MEDICINA y SEGURIDAD del trabajo

Revisiones

Attitudes toward the risk prevention in health professionals in cases of epidemiological alert

Actitudes hacia la prevención de riesgos laborales en profesionales sanitarios en situaciones de alerta epidemiológica

Belén Collado Hernández[1-3], Yolanda Torre Rugarcía[2-3]

1. *Mutua Montañesa de Cantabria. Spain.*
2. *Hospital Universitario Marqués de Valdecilla. Spain.*
3. *Teaching Unit of Occupational Health of Comunidad de Madrid. Madrid. Spain*

Recibido: 13-03-15
Aceptado: 05-05-15

Correspondencia
Belén Collado Hernández
Residente Medicina del Trabajo UD Cantabria
Mutua Montañesa. Cantabria. España.
Teléfono: 636 513 212
Correo electrónico: belencollado@hotmail.com

This work has been carried out as part of the Scientific Program of the National School of Occupational Medicine of the Carlos III Health Institute under an agreement with the Teaching Unit of Occupational Medicine of the Community of Madrid, Spain.

Abstract

Objectives: To explore the scientific evidence regarding the behavior of health professionals in pandemic situations. Identify areas of improvement for the strengthening of health professionals before pandemic situations. Secondary Objectives: To identify the psychosocial impact, adoption and adherence to preventive measures and vaccination programs.

Methods: Systematic review of the scientific literature collected in the MEDLINE (PubMed), Scopus and Cochrane Library Plus data until December 2014. The terms used as descriptors were: «Disease Outbreaks», «Coronavirus, sars», «Severe acute Respiratory Syndrome», «Influenza virus, subtype H1N2», «Health occupations», «Emergencies, Infectious disease transmission», «patient-to-professional», «Infectious disease transmission, professional-to-patient».

Results: 181 references after the elimination of duplicates and application of the criteria for inclusion and exclusion and analysis of quality using the STROBE criteria, was a final collection of 17 articles were retrieved. The level of evidence found according to Sign Criteria is three as it is in all cases of cross-sectional studies. 11 Authors refer to psychosocial effects, 3-vaccination and 12 to adherence to preventive measures. In general preventive measures in the two pandemics were well appreciated and followed by professionals. A significant burden of stress for fear of getting sick is generated; infect their families and high workload. Low adherence to vaccination programs and use of scientific literature.

Conclusions: It would be advisable to improve communication about preventive measures in times of pandemic to increase adherence and psychological support to health workers.

Med Segur Trab (Internet) 2015; 61 (239) 254-272

Keywords: *Disease outbreaks, Coronavirus, SARS, Severe Acute Respiratory Syndrome, Influenza a virus, H1N2 subtype, Health occupations.*

Resumen

Objetivos: Conocer la evidencia científica existente en relación al comportamiento de los profesionales de la salud en situaciones de pandemia. Identificar puntos de mejora para el fortalecimiento de los profesionales sanitarios antes situaciones de pandemia. Objetivos secundarios: Identificar el impacto psicosocial, adopción y adhesión a medidas preventivas y a programas de vacunación.

Métodos: Revisión sistemática de la literatura científica recogida en las bases de datos MEDLINE (Pubmed), SCOPUS y Cochrane Library Plus hasta Diciembre de 2014. Los términos más utilizados como descriptores fueron: «Disease outbreaks», «Coronavirus, sars», «Severe Acute Respiratory Syndrome», «Influenza a virus, h1n2 subtype», «Health occupations», «Emergencies, Infectious disease transmission», «patient-to-professional», «Infectious disease transmission, professional-to-patient».

Resultados: Se recuperaron 181 referencias que tras la eliminación de duplicados y aplicación de los criterios de inclusión y exclusión y análisis de calidad mediante los criterios STROBE, resultó una colección final de 17 artículos. El nivel de evidencia encontrado según los Criterios Sign es tres ya que se trata en todos los casos de estudios transversales. 11 autores hacen referencia a efectos psicosociales, 3 a la vacunación y 12 a adhesión a medidas preventivas. En general las medidas preventivas en las dos pandemias fueron bien valoradas y seguidas por los profesionales. Se genera una importante carga de estrés por el miedo a enfermarse, contagiar a sus familias y la elevada carga laboral. Baja adherencia a programas de vacunación y a la utilización de literatura científica.

Conclusiones: Sería recomendable mejorar la comunicación sobre las medidas preventivas en periodos de pandemia para aumentar su adherencia así como dar apoyo psicológico al personal sanitario.

Med Segur Trab (Internet) 2015; 61 (239) 254-272

Palabras clave: *Epidemia, Coronavirus, SARS, Síndrome respiratorio agudo severo; Virus de la gripe A subtipo H1N1, Personal sanitario.*

INTRODUCTION

The latest global health alert the XXI century has been caused by the Ebola virus. It began in December 2013 in Guinea and later spread throughout West Africa. Currently there are 21,362 cases and 8,478 deaths worldwide (WHO 01/11/2015). The first contagion in Europe was declared in Spain in October 2014. It was a nursing assistant who had been in contact with the two missionaries repatriated. Two nurses were infected in the same way USA. This created a major social and health warning about the possible failure of preventive measures related mainly to medical staff and PPE used.

Two other pandemics were previously reported in this century, SARS and influenza A (H1N1). In relation to SARS, OMS[22] said 8,098 cases between November 2002 and July 2003. Of these, 1,707(21 %) were health workers (Shapiro et al.[10]). Influenza A, in late September 2009, affected globally to over 343,298 with about 4,108 deaths (Alenzi et al.[1]) with a high percentage of health workers affected.

In the case of swine flu (H1N1) measures established by the CDC (Centers for Disease Control and Prevention[20]) were: 1) Review and / or development of plans for pandemic prevention by health centers and report them to the staff. These in turn should receive training on disease prevention (vaccination, EPIS...) and the risk of complications. 2) Reduce potential exposures (limit transport patients, visitors...). 3) Physical controls such triage separate areas. 4) Promotion and provision of vaccine (free during work hours, refusal form fill where applicable). 5) Provide appropriate education PPE and use (N-95 masks, non-sterile gloves...). 6) Hand hygiene and respiratory hygiene. 7) Quarantine (up to 24 hours of disappearance of fever without antipyretics) mandatory for health workers should be monitored for signs/symptoms of the disease.

Referring to SARS were to follow the measures described above and also under the Protocol for Surveillance and Control of SARS (National Centre for Epidemiology Institute Salud[21] Carlos III, May 2004.): 1) The quarantine will be up to 48 hours of cessation of fever. 2) negative pressure rooms if possible. 3) PPE: disposable hats, eye protection, gloves, disposable clothing (overalls/aprons/gowns), decontaminable boots. Respiratory protection is not reusable: surgical mask (protection issue) and respiratory protective devices (protection inhalation) that are certified according to European standard (EN 149: 2001 FFP2 and FFP3) and (UNE-EN 143: 2000 P2). In Spain the use of protective FFP2 (staff not caring for the patient) and FFP3 (direct patient contact) is recommended.

All these preventive measures can be in accordance with what difficult circumstances to perform. Not only because of the possibility of such negative pressure room or appropriate PPE if not acceptance or rejection thereof by the health workers could occur for example on the issue of vaccination that ultimately would be a decision staff.

The presence of a pandemic could bring psychosocial consequences among health workers related to concerns about the spread or the health of your family. All this can produce a significant stress load that could see increased if we consider that a significant volume of patients by the general alarm the population increase during epidemics.

The health sector is a high-risk group in pandemic situations. The aim of this paper is to review the literature to learn the scientific evidence regarding the behavior of health professionals in pandemic situations and identify areas of improvement for the strengthening of health professionals in these situations. As secondary objectives we have set out to identify the psychosocial impact, adoption and adherence to preventive measures and adherence to vaccination programs.

MATERIAL AND METHODS

The study was conducted using techniques of systematic review of the literature obtained by direct contacts and access, via the Internet, available in three databases (Table 1), International Literature Medlars Online (MEDLINE), via PubMed, Scopus and Cochrane Library Plus.

To define the search terms MeSH terms (thesaurus developed by the US National Library of Medicine) were employed, using the descriptors listed in Table (Table 1) in text format in title and/or abstract.

Table 1. Terms, equations and descriptors

MeSH Terms	Disease outbreaks Coronavirus, sars Severe Acute Respiratory Syndrome Influenza a virus, h1n1 subtype Health occupations Emergencies Infectious disease transmission, patient-to-professional Infectious disease transmission, professional-to-patient
Operators	AND OR
Databases	MEDLINE, vía Pubmed SCOPUS Chochane Library Plus
Filters	Human Adults (19 and…) Abstract Last 5 years Last 10 years

With them different Boolean combinations are made finally obtaining three equations search (Table 2) in MEDLINE/PubM. The filters listed in the table (Table 1) were used. The same strategy was adapted to the characteristics of other databases consulted. The search was performed from the first available date, according to the characteristics of each database, until November 2014 (time of last update).

Table 2. Search equations

EQUATIONS SEARCH	DATABASES
(disease outbreaks[MeSH Terms]) AND (coronavirus, sars[MeSH Terms]) OR Severe Acute Respiratory Syndrome[MeSH Terms]) OR influenza a virus, h1n2 subtype[MeSH Terms])) AND health occupations[MeSH Terms]	
(disease outbreaks[MeSH Terms]) AND (coronavirus, sars[MeSH Terms]) OR Severe Acute Respiratory Syndrome[MeSH Terms]) OR influenza a virus, h1n2 subtype[MeSH Terms])) AND health occupations[MeSH Terms] and emergencies [MeSH Terms].	Medlars Online International Literature (MEDLINE)
(disease outbreaks[MeSH Terms]) AND (coronavirus, sars[MeSH Terms]) OR Severe Acute Respiratory Syndrome[MeSH Terms]) AND health occupations[MeSH Terms].	SCOPUS
("infectious disease transmission, patient-to-professional"[MeSH Terms] OR "infectious disease transmission, professional-to-patient"[MeSH Terms]) AND (("disease outbreaks"[MeSH Terms] AND "sars virus"[MeSH Terms] OR "severe acute respiratory syndrome"[MeSH Terms]) OR "influenza a virus, h1n1 subtype"[MeSH Terms]) AND "health occupations"[MeSH Terms] AND (abstract[text] AND "humans"[MeSH Terms] AND (English[lang] OR Spanish[lang])).	Cochrane Library Plus.

The final choice of articles was performed as meeting the inclusion criteria:

— Adapting to the objectives of the search.
— Population studies collected should be health workers.
— Provide summary.
— Ability to retrieve the full text of the paper.
— English or Spanish language.

Articles were excluded:

— Do not contributed empirical information regarding the effects of a health alert health professionals.
— Population studied different health sector.
— Editorials and review articles
— Duplicate publications, including in the analysis, in this case, the most complete study.

The selection of relevant articles was performed independently by two authors of this review.

To give as valid the inclusion of studies established that the valuation of the concordance between the two authors (Kappa index) should be one. The possible discrepancies between the two authors should be resolved by consensus between them.

To assess the quality of the articles selected for publication guidelines observational studies STROBE[23] were used. Items are grouped, in order to systematize and facilitate the understanding of the results, according to the study variables, considering the variables listed in Table 3. In addition the SIGN criteria were used for the allocation of evidence for selected items.

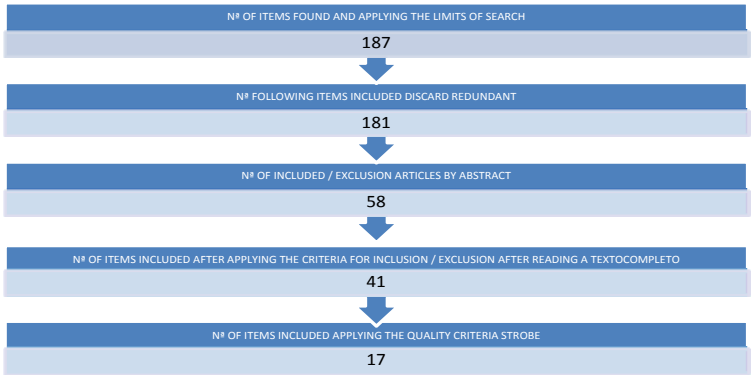
Table 3. Variables

VARIABLES
Title
First author name and year of publication
Citation of the journal
Type of study
Sample and sampling
Type of analysis
Statistical tests and measures of association
Variable effect
Variable factor
Bias control
Main results
Conclusions
Limitations
Advances

RESULTS

With the search criteria described a total of 187 references were collected, of which after applying the criteria of inclusion and exclusion reading the summary, and discard duplicates and non-refundable full text, 41 items are selected, of which full text after reading and analyzing their methodological quality according to the STROBE criteria are considered relevant 17. All works are from MEDLINE and SCOPUS not found publications that met the criteria for inclusion and exclusion in the Cochrane Library (Figure 1 and Table 4).

Figure 1. Flowchart search



All the studies reviewed are treated cross-sectional studies, and therefore their level of evidence is 3 (SIGN) so to implement more quality to the results of the review it was decided to evaluate it, using the questionnaire STROBE[23] (Table 5) to give a score ranging between 13.5 and 18.5, indicating that all items have good or excellent quality.

Table 4. Summary of search

Databases	Equations search	N.ª items obtained with quick search	N.ª of redundant articles	N.ª selected articles by abstract	N.ª of items to meet criteria for exclusion/ inclusion	Total
PUMBED	(disease outbreaks[MeSH Terms]) AND (coronavirus, sars[MeSH Terms]) OR Severe Acute Respiratory Syndrome[MeSH Terms]) OR influenza a virus, h1n2 subtype[MeSH Terms])) AND health occupations[MeSH Terms]	100	1	19	7	7
	(disease outbreaks[MeSH Terms]) AND (coronavirus, sars[MeSH Terms]) OR Severe Acute Respiratory Syndrome[MeSH Terms]) OR influenza a virus, h1n2 subtype[MeSH Terms])) AND health occupations[MeSH Terms] and emergencias [MeSH Terms]	5	3	2	0	0
	(disease outbreaks[MeSH Terms]) AND (coronavirus, sars[MeSH Terms]) OR Severe Acute Respiratory Syndrome[MeSH Terms]) AND health occupations[MeSH Terms]	38	1	24	3	3
	(“infectious disease transmission, patient-to-professional”[MeSH Terms] OR “infectious disease transmission, professional-to-patient”[MeSH Terms]) AND ((“disease outbreaks”[MeSH Terms] AND “sars virus”[MeSH Terms] OR “severe acute respiratory syndrome”[MeSH Terms]) OR “influenza a virus, h1n1 subtype”[MeSH Terms]) AND “health occupations”[MeSH Terms] AND (hasabstract[text] AND “humans”[MeSH Terms] AND (English[lang] OR Spanish[lang]))	22	1	3	2	2
SCOPUS	(disease outbreaks[MeSH Terms]) AND (coronavirus, sars[MeSH Terms]) OR Severe Acute Respiratory Syndrome[MeSH Terms]) OR influenza a virus, h1n2 subtype[MeSH Terms])) AND health occupations[MeSH Terms]	22	0	10	5	5
Cochrane	(disease outbreaks[MeSH Terms]) AND (coronavirus, sars[MeSH Terms]) OR Severe Acute Respiratory Syndrome[MeSH Terms]) OR influenza a virus, h1n2 subtype[MeSH Terms])) AND health occupations[MeSH Terms]	0	0	0	0	0

Table 5. STROBE of the articles included in the review

Reference	Title and summary	Introduction	Methods	Results	Discussion	Other information	Total	%
Nukui. Y. et al.	1	2	5	2	4	0	**14**	**63.3**
Wong. WCW. et. Al	1	2	5	3	4	0	**15**	**68.2**
Wu Meng. T. et al.	1	2	4.5	3	3.5	0	**14**	**63.3**
Seale. H. et al	1	2	6.5	5	4	0	**18.5**	**84.1**
Sebahat. D. T. et al.	1	2	6.5	3.5	4	0	**17**	**77.3**
Vinck. L. et al.	1	2	4.5	3	4	0	**14.5**	**65.9**
Martin. S. D. et al.	1	2	5	3	2	0.5	**13.5**	**61.4**
Wong ELZ. et. al.	1	2	6	5	4	0.5	**18.5**	**84.1**
Verma. S. et. al.	0.5	2	4	3	4	1	**14.5**	**65.9**
Shiao. J. S. et. al.	1	2	4.5	2	3	1	**13.5**	**61.4**
William. C. W. et. Al.	0.5	2	6	4	3.5	0	**16**	**72.7**
Leslie. A. Nickell. et. al.	0.5	2	7	4	4	1	**18.5**	**84.1**
M. J Parker. et. al.	0.5	2	7	3	4	0	**16.5**	**75**
Chih -Cheng Hsu. et al.	0.5	2	6.5	3.5	3	0	**15.5**	**70.4**
La Torre. et. al	0.5	2	4	3.5	4	0	**14**	**63.3**
Tolomizcenko. Gs. et. Al	0.5	2	5.5	3	3	1	**15**	**68.2**
Alvaro. J. Idrovo. et al.	0.5	2	7.5	3	4	0	**17**	**77.3**

The study of Tan WM. et al.[12] was presented smaller sample size (n = 90), whereas de Nickell LA. et al.[6] work was larger l (n = 2001). In two of the 17 items the study population was purely medical. The study of Idrovo AJ. et al.[3] included only medical students graduate and three studies the sample belonged entirely to nurses case of predominantly female population.

Table 6. Resultados obtained from reviewed articles

ID	Author/ publication year	Title	Reference magazine	Type of study	Sample/ sampling	Variable effect	Variable factor	Control of bias	Analysis done	Statistical test	Results	Conclusions	Limitations	Sign	Progress	Strobe
16679173	Hsu C-C/ 2006	Confidence in controlling a SARS outbreak: experiences of public health nurses in managing home quarantine measures in Taiwan.	Am J Infect Control. May 2006;34(4):176-81.	Cross-sectional study.	312 public health nurses in a hospital in Taiwan.	Perceived severity and control of the pandemic by public health nurses. Compliance with quarantine measures by the population.	SARS outbreak	Information bias. Recall bias is avoided by the study done at the time of the pandemic.	Distributional factor analysis.	Multiple logistic regression. OR.	71.9 % of nurses general lack of confidence. This is associated with : perceived severity of the epidemic (OR 0.58 95% CI 0.35 to 0.99) , epidemic performances daily (OR 2.6 95% CI 1.28-3.98) and number of cases in the community (OR 2.1 95% CI 1.13-4.31) ; nurses as people were less likely to cooperate with quarantine measures when : less knowledge about SARS (OR 3.66 95% CI: 1.99-6.75) , those who express less fear (OR 3.19 95% CI: 1.85-6.21) , the health centers not working well (OR 2.16 95% CI 1.17-4.00).	Individual risk perception and quick update on information affects levels of professional confidence; reports received by nurses were outdated because the data were worse still and controlled the outbreak; Lower levels of confidence in places with fewer cases in the community.	Survey of nurses closely related to the pandemic and with over 10 years experience and not the rest.	3	implement in the future effective quarantine of the entire community and the importance that will have this attached to the great challenge in health posed associated with future health education programs .. Elaboration of participativas future policies in such situations and these can contribute to the control of pandemic	16,5
16627854	Parker MJ/ 2006	Paediatric emergency department staff perceptions of infection control measures against severe acute respiratory syndrome.	Emerg Med J. Mayo de 2006;23(5):349-53.	Cross-sectional study.	863 : 335 doctors and 501 non-medical emergencies in a tertiary hospital with 50,000 visits per year	Preventive measures they consider most effective.	SARS outbreak	Selection bias. Participation bias.	SPSS for Windows (version 10.0)	Chi -square, descriptive analysis and SD for continuous variables, categorical data summarized in % . analysis of variance	More effective measures : Use of isolation wards (4.6 of 5 points with p : 0.02 95% CI : 4.5-4.8) respirator (4.5 / 5 with p : 0.001IC of p5 % : 4.3-4.6) and handwashing (4.6 with p : 0.03 95% CI : 4.4-4.7) physicians reported wash his nurses and auxiliary (4.9 v 4.5 and 4.5 , respectively ; p < 0.05). Respondents who considered the SARS as a high risk to public health : greater compliance with handwashing (4.8 v 4.4) always with mascara (3.9 v 3.2) and gloves (3.6 v 2.9) p < 0.05 , but no eye protection (3.4 v 3.0) , gowning (4.9 v 4.7) or mask when examining patients (5.00 v 4.8).	Eye protection is perceived as moderately effective in protecting against SARS and therefore compliance was pobre.La concern of SARS as a health threat appears to have greater impact in meeting the perceived effectiveness of prevention measures . Discordance between perceived risk and compliance reporting.	This survey of emergency personnel and non compliance is documented in real time with SARS measures (possible reporting bias) The study has not been previously validated by a small sample selected to assess the objectivity of it.	3	Development control equipment less restrictive infections more acceptable for staff; need to study more and understand the psychosocial effects of SARS on hospital staff over time	18.5

Table 7. Resultados obtained from reviewed articles

ID	Author/ publication year	Title	Reference magazin	Type of study	Sample/sampling	Variable effect	Variable factor	Control of bias	Analysis done	Statistical test	Results	Conclusions	Limitations	Sign	Progress	Strobe
22124695	Idrovo AJ/2011	Perception of epidemiological competencies by public health students in Mexico and Colombia during the influenza A (H1N1) epidemic.	Rev Panam Salud Publica. October 2011; 30 (4): 361-9.	Cross-sectional study.	154 graduate students : 86 Mexico and 68 Colombia. Simple random sampling.	Existing skills and training needs.	Influenza A outbreak (H1N1).	Selection bias and information bias.	Stata11 statistical program . factor Analysis.	Chi-square . Fisher.U exact Mann -Whitney.	Low score on current capacity in relation to the link between health workers and the community. (21.5 % variance).	Response to the epidemic could have been better.	Instrument used was designed to evaluate staff with responsibilities for field epidemiologist.	3	Identifying areas of opportunity to improve the teaching of epidemiology to health contingencies.	17
22173523	Nukui Y/2012	Pandemic 2009 influenza A (H1N1) virus among Japanese healthcare workers: seroprevalence and risk factors.	Infect Control Hosp Epidemiol. January 2012; 33 (1) : 58-62.	Cross-sectional study.	262 doctors, 176 nurses, 23 workers no patient contact. Stratified random sampling.	Seroprevalence and risk factors for H1N1 among health workers.	Influenza A outbreak (H1N1).	Selection bias: Exclusion diagnosed / suspected gripeA and vaccinated. Information bias.	SPSS Statistics 18 (IBM). Univariate logistic regression analysis and multivariable.	OR, Chi - square.	Increased risk of seropositivity (OR : 5.25) between nurses and doctors as well as staff pediatrics, emergency and internal medicine (OR : 1.98). No differences in the use of PPE (p > 0.05).	Seropositivity H1N1 is a risk factor for occupational health workers.	Low levels of seroconversion reduce the power of the study to investigate relationship between exposure and use of PPE.	3	Health workers is a priority group for vaccination against H1N1 because of the high risk of infection.	14
14966227	Wong WCW/2004	How did general practitioners protect themselves, their family, and staff during the SARS epidemic in Hong Kong?	J Epidemiol Community Health . March 2004; 58 (3): 180-5.	Cross-sectional study.	137 GPs. Simple random sampling.	Level of anxiety, clinical practice , personal and family protection.	SARS outbreak.	Selection bias and information bias.	SPSS	Chi -square analysis of variance.	SARS changed their clinical practice (97 %). Levels of anxiety elvados infect relatives (p < 0.01) .Desacuerdo to follow quarantine after contact (p < 0.01) 97.7 % had worn masks all the time, 25 % no handwashing, 50 % were not wearing protective gown , 75 % did not wear glasses, 25 % wore gloves and temperature was taken daily.	General practitioners modified their clinical practice. They fault isolation measures of suspected cases of SARS spread increased their lack of contingency plan.	Small sample size (representing 3-4% general practitioners). Type of study.	3	SARS exposed the weaknesses of the health system of Hong Kong and the need to change health policy and clinical practice	15
21211593	Seale H/2011	Acceptance of a vaccine against pandemic influenza A (H1N1) virus amongst healthcare workers in Beijing, China	Vaccine. February 11, 2011 ; 29 (8): 1605-1610.	Cross-sectional study.	1657 health workers (604 doctors , nurses 1044, another 9). Random sampling (RCT clinical trial on the use of masks and respirators).	Degree of vaccination against H1N1 health workers and associated factors. Attitudes to the vaccine.	Influenza A outbreak (H1N1).	Selection bias and information bias.	Multivariate analysis Epi Info version 33.2.	OR, Chi - square.	25% of participants received the vaccine. Associated factors (vaccination against seasonal influenza) 61% worried about side effects. 46% vaccine was not properly tested.	Contrary to previous studies that had reported the high predisposition to receive vaccine this did not happen.	Questionnaire (bias in the interpretation of data) non-representative sample of the general population.	3	Need for nursing staff aware of the need for vaccination.	18,5
20600497	Torun SD/2010	Vaccination against pandemic influenza A/H1N1 among healthcare workers and reasons for refusing vaccination in Istanbul in last pandemic alert phase	Vaccine. August 9, 2010 ; 28 (35): 5703-10.	Cross-sectional study.	941 individuals : 277 doctors, 189 nurses , 111 paramedics and 364 non-health workers. random sampling.	Grade vaccination workers (associated factors) and grade of recommendation of the vaccine (associated factors).	Influenza A outbreak (H1N1).	Selection bias and information bias.	Multivariate analysis SPSS10.0.	Pearson coefficient , Chi-square, Fisher exact test.	23.1% workers received vaccination. 76.1% refusal cause fear side effects. Degree of vaccination was higher in physicians regarding the rest (X^2: 20,23) . 59.6 % doctors recommended vaccination to their patients.	Vaccination against H1N1 is insufficient among health care workers.	Type of study , no complete response rate and advanced stage of the pandemic.	3	Need for training and scientific information regarding efficacy and safety of the vaccine among health care workers.	13,5
17334166	Shiao JS-C /2007	Factors predicting nurses' consideration of leaving their job during the SARS outbrea	Nurs Ethics. January 2007; 14 (1): 5-17.	Cross-sectional study.	753 nurses. Random sampling.	Risk perception of SARS , leaving the workplace and associated factors workload.	SARS outbreak.	Selection bias and information bias.	Regression analysis . SAS JMP (Version 5.01).	OR, IC(p).	71.9 % perceived risk of infection , 49.9 % increase in workload, 32.4 % people avoided them for their work , 7.4 % seriously considered leaving their jobs.	During SARS pandemic almost 10% considered leaving their jobs.	83 % response rate . Type of study.	3	It is necessary to provide emotional and professional support nurses during pandemics.	13,5
14993174	Nickell LA/ 2004	Psychosocial effects of SARS on hospital staff: survey of a large tertiary care institution	CMAJ . March 2, 2004 ; 170 (5): 793-8.	Cross-sectional study.	2001 health workers in a tertiary hospital in Toronto (27 % of workers in the hospital).	Concern about SARS; precautionary measures; personal welfare ; sociodemographic characteristics and general health survey.	SARS outbreak.	Information bias.	SPSS; Bivariate analysis to identify explanatory variables; multivariable logistic regression to assess association between outcome variables and potential losses.	Multivariate techniques; OR and 95 % CI.	about the health of your family .In the 510 who completed the GHQ -12 , 148 (29.0 %) scored above the threshold more than 3, indicating probable emotional distress. (p < 0.001) with a score greater than 3 : 45.1 % of nurses , 33.3 % of professionals allied health care , 17.4 % and 18.9 % medical personnel that does not work contact the quoted paciente.Mascarilla caution as most annoying . 74.1 % control measures were sufficient to prevent contagion. 4 factors associated with increased levels of concern for personal or family health : the perception of an increased risk of death from SARS (adjusted odds ratio [OR] 5.0, 95 % confidence interval [CI] 02 / 09/06 06) living with children (adjusted OR 1.8 , 95% CI 1.5 to 2.3).	2/3 of the person experiencing concern for their own health or that of your family. It was also reported positive aspects of the SARS epidemic . Thus, the staff noted an increased awareness of infection control , you can still benefit from the hospital community in the future. Some respondents found that the situation provided a positive learning experience and a greater sense of unity and cooperation among hospital staff.	Low response rate (47%) and also the possibility of response bias ; staff were quarantined or out because of illness or holiday was not included and may be the most affected ; using the GHQ -12 was limited to a portion of the sample can affect the results ; the study was conducted in a large hospital so the results.	3	Increase in future briefings least weekly updated information . Trying to find strategies for hospitals to respond quickly to the concerns of nursing related to their concerns and the patients themselves.	18,5

Table 8. Resultados obtained from reviewed articles

ID	Author/ publication year	Title	Reference magazin	Type of study	Sample/sampling	Variable effect	Variable factor	Control of bias	Analysis done	Statistical test	Results	Conclusions	Limitations	Sign	Progress	Strobe
21345320	Vinck I./2011	Impact of the 2009 influenza A(H1N1) pandemic on public health workers in the Netherlands.	Euro Surveill. 2011;16(7).	Cross-sectional study.	77 doctors, 85 nurses and 4 managers hospital. Random sampling.	Workload and anxiety infected.	Influenza A outbreak (H1N1)	Selection bias and information bias.	Descriptive statistics. SPSS v.18.0	Parametric and nonparametric test. Analysis of covariance (ANCOVA). T-student , Chi-square, ∝ of Cronback .	70.5 % increase in workload, 60 % had no anxiety about spreading disease . 48 % looked to the reference information and Response Measures against H1N1. 88 % used PPES (FFP 2 , gloves, glasses ...). 71-97 % informing patients about protective measures.	Excessive workload during the initial 3-5 months of the pandemic. Low levels of anxiety. Low levels of consulting the reference center.	Data collected at 9 months of the pandemic . Higher proportion of physicians than nurses.	3	Importance of adequate preparation plans for future epidemics. Need to temporarily increase the workforce . Improved training by medical personnel.	14,5
20473456	Tan WM/2010	Attitudes of patients, visitors and healthcare workers at a tertiary hospital towards influenza A (H1N1) response measures	Ann Acad Med Singap. Abril de 2010;39(4):303-4.	Cross-sectional study.	90 Participants : 32 patients, 11 visitors, 47 health workers. Random sampling.	Influence of measures against H1N1 in their daily work.	Influenza A outbreak (H1N1)	Information bias: survey.	Microsoft Excel Pivot Table Software and Function	Categorical data distributed in %.	84 % agreed on measures taken . 72 % doctors: measures influenced negatively in their working day. 34.6 % excessive measures.	Perceived as excessive measures will be accepted if the disease has high mortality rates.	Small sample size.	3	Faced with new pandemics whose lethality is unknown implementing preventive measures should be accompanied by important communication explaining the uncertainties of the authorities and benefits individual measures.	14
21223410	Martin SD/2011	Nurses' ability and willingness to work during pandemic flu.	J Nurs Manag. Enero de 2011;19(1):98-108.	Cross-sectional study.	735 nurses . Stratified random sampling.	Working capacity and willingness to go to work.	Influenza A outbreak (H1N1)	Selection bias and nonresponse bias.	Minitab 15 Windows 2006.	Z-test p<0.05	93% work with full PPE (N -95 mask , gown, gloves).	Family and disposal of PPE plays an important role in the will to go to work. Pregnant women should not serve patients suspected / diagnosed influenza A.	Low diversity of the sample (race, ethnicity, gender). Mide intention. Biases.	3	Have appropriate PPE influences the willingness to go to work.	13,5
20433691	Wong ELY/2010	Will the community nurse continue to function during H1N1 influenza pandemic: a cross-sectional study of Hong Kong community nurses?.	BMC Health Serv Res. 2010;10:107.	Cross-sectional study.	267 community nurses. Random sampling.	Psychological aspects and job satisfaction. Varables demographic and willingness to work.	Influenza A outbreak (H1N1)	Selection bias and information bias	Logistic regression analyzes. SPSS version 15.0.	OR p<0.05	76.9%: 33.3% did not want to go , and 43.6 % are not trained to care for patients with influenza A. 59% have stress, 29.2 %fear of infection. 33% used clinical guidelines for infection control for care their patients.	Provide training and counseling increase willingness to go to work.	Type of study , not included marital status and family status. Only community nurses.	3	Need for training in infection control by the nursing staff.	18,5
15608831	Verma S/2004	Post-SARS psychological morbidity and stigma among general practitioners and traditional Chinese medicine practitioners in Singapore.	Ann Acad Med Singap. Noviembre de 2004;33(6):743-8.	Cross-sectional study.	721 doctors and 329 practitioners of Traditional Chinese Medicine. Random sampling.	Psychological distress (GHQ -28) , post-traumatic stress disorder , proportion of stigma (HIV Stigma Scale).	SARS outbreak	Selection bias and information bias	Frequency distribution for descriptive data. SPSS v.10.	Chi-square, Fisher exact test, OR, Mann-Whitney, Spearman correlation.	GHQ -28 score , perceived stigma and PTSD was higher in general medical p<0.05	Fear, uncertainty and stigma caused by SARS is associated with psychological distress among general practitioners.	Low response rate. Rating scale stigma of HIV SARS was modified. Type of study.	3	Psychological needs of health workers must be explored and discussed during periods pandemic.	14,5
22006167	La Torre G/ 2012	Knowledge, attitude, and behaviour of public health doctors towards pandemic influenza compared to the general population in Italy.	Scand J Public Health. Febrero de 2012;40(1):69-75.	Cross-sectional study.	335 doctors and 501 non-medical in Italy.	Socio- demographic information, knowledge and behavios.	Influenza A outbreak (H1N1)	Participation bias and information bias.	SPSS statistical program v19.o.	Chi-square, variance p<0.05	Doctors more interested in updated on Pandemic (90.6 % vs 88.4 % p = 0.03) ; nonmedical more inclined to avoid crowded places (29.7 % versus 88.4 % with p < 0.01) ; doctors more willing to be vaccinated (56.4% versus 23.6 % with p<0.01); main source of information for physicians internet (41.5%) and second internal sources hospital (33.1%) while no doctors get from television (34.1%) followed by internet (30.9%).	Lots of information propagated so chaotic (even a significant percentage of doctors with false beliefs and lack of infection, treatment).	Questionnaire answered by volunteers via internet.	3	Need to take measures for further information and efficient communication.	14

Table 9. Resultados obtained from reviewed articles

ID	Author/ publication year	Title	Reference magazin	Type of study	Sample/sampling	Variable effect	Variable factor	Control of bias	Analysis done	Statistical test	Results	Conclusions	Limitations	Sign	Progress	Strobe
15788070	-Tolomiczenko GS/ 2005-	SARS: coping with the impact at a community hospital.	J Adv Nurs. April 2005; 50 (1): 10-10.	Cross-sectional study.	300 health workers (medical and nonmedical) of Mount Sinai Hospital in Toronto.	Patient care; communication and relationships; decision making; involvement in personal life .	SARS outbreak.	Information bias.	SPSS	Fisher exact test; Mann Whitney U-test and Chi-square.	(p < 0.005) between the following domains : factors that adversely affect patient care , communication , support , working conditions , decision making and to a lesser extent, the impact on life outside work. All groups found stressful SARS , nurses reported a greater impact inthe morale and job satisfaction . These were based more on peer support , less informed , less involved in making medical decisions , and were more likely to report that infection control procedures were not quite strict.	Differences between groups and pattern of these differences clearly illustrate the impact and stress that SARS was in a hospital with only a small number of probable or suspected cases. The clear differences entregrupos defined by demographic variables, clinical professions and roles suggest a secondary impact of the SARS epidemic , with repercussions health care . Facilities must deal with while maintaining a higher level of monitoring in SARS.	In 1650 only 1,100 workers had a chance to respond and only 27 % answers.	3	Importance of the need for precise implantation of information sources to avoid raising the alarm and false beliefs.	16
17276791	Wong WCW/ 2007	How to provide an effective primary health care in fighting against severe acute respiratory syndrome: the experiences of two cities.	Am J Infect Control. February 2007; 35 (1): 50-5.	Cross-sectional study.	137 doctors in Hong Kong and 51 physicians Toronto.	Training in infectious and information about SARS. Clinical practice and perceived patient behavior changes. Anxiety level medical and satisfaction in the government's attitude with SARS.	SARS outbreak.	Information bias.	SPSS v 13	Chi - square; multiple logistic regression . OR	84.6 % and 80.0 % of Hong Kong and Toronto respectively had no training in controlling enf . Infectious without trust with the SARS (68.1 % and 73.5 % respectively) ; Hong Kong doctors wanted more complementary tests (OR 37.8 , 95% CI 12.65-113.06) . Doctors in Hong Kong fewer delays or cancellations of appointments. (OR 0.39 95% CI 0.20 to 0.76) . General practitioners not associated SARS loss of income, either by more willingness and commitment or satisfaction of handling SARS , showing that in both countries were willing to take responsibility and get involved.	Differences between two models perform SARS pandemic showing centralizing or Hong Kong (with its training and resource gaps) or the method of Canadian patients distribute all hospitals dosing all non-urgent consultation (with consequent waiting lists, health chaos and massification of health centers) were the perfect size	Participation bias.	3	The need to support health centers in the future besides communication and collaboration between these and hospital systems to better control epidemics in the future. Need to establish a mechanism for deploying personnel between institutions.	15

Psychosocial impact

We found seven articles referring to stress, anxiety, and all elevated levels of both states are evident during the two pandemics, except Vinck L. et al.[16] in a study conducted during the pandemic influenza A doctors, nurses and managers through voluntary questionnaires, finds that 60% does not show anxiety infected. Contrary to this LA Nickell obtained. et al.[6] in a study conducted during the SARS pandemic in Toronto about psychosocial factors of health personnel. It notes that 64.7% showed concerned about your health. Additionally, we can add as Wong WCW. et al.[18] also anxiety spread themselves, have high level of anxiety infect their families (p '0.01). LA Nickell. et al.[6] identified four factors associated with increased concern for personal or family health: the perception of an increased risk of death from SARS (adjusted OR [OR]: 5.0; 95% confidence interval CI 2.06 to 9.06) live with children (adjusted OR 1.8, 95% CI 1.5 to 2.3), personal or family life affected by the outbreak of SARS (adjusted OR: 3.3; 95% CI: 2.5 to 4.3) and being treated in a manner different from working in a hospital (adjusted OR: 1.6; 95% CI: 01.02 to 02.01). Moreover, in the same study objective to work in a management or supervisory (adjusted OR: 0.6; 95% CI: 0.4 to 0.8), the belief that preventive measures in the workplace were sufficient (adjusted OR: 0.4; 95% CI 0.3-0.5) and have 50 or more years (adjusted OR, 0.6; 95% CI 0.4-0.9) was associated with decreased concern about the pandemic.

In two of the 17 items you decide to use a questionnaire (GH28 and GH12) to specifically measure anxiety levels. S. Verma et al.[15] studied during the SARS pandemic in China the difference in terms of psychological morbidity among physicians and practitioners of traditional Chinese medicine, thus proving that stigma and PTSD was higher among general practitioners (p '0.05). However, LA Nickell. et al.[6] comparing all health workers found that nurses were those who had been most affected in their work on a psychological level, with statistically significant differences (p '0.001) 45.1% (37/82) of the nurses, compared to 33.3% (66/198) of professional allied health care, 17.4% (8/46) of physicians and 18.9% (28/148) of staff does not work in patient care. Furthermore the author mentions that the factors significantly associated with the presence of emotional distress are: being a nurse (adjusted OR: 2.8; 95% CI: 01.05 to 05.05), the situation of part-time employment (adjusted OR: 2.6, 95% CI 1.2 to 5.4), the lifestyle affected by the outbreak of SARS (adjusted OR 2.2, 95% CI 1.4 to 3.5) and impaired the ability to do your job because of preventive measures (OR adjusted 2.9; 95% CI: 1.9 to 4.6).

Two authors refer to the workload, from the psychological point of view, that pandemics occur in health care workers, finding none of the 17 references any physical load. Shiao JS-C. et al.[11] studied the factors influencing decide to abandon their work on nurses during the SARS pandemic finds that 49.9% of them perceived increase in workload. L. Vinck et al.[16] obtained better results when valuing during pandemic influenza A (70.5% increase in workload).

Adoption and adherence to preventive measures

Regarding preventive measures ae both Vinck's article L. et al.16 like Martin SD et al.[5] coincide more or less in the percentage of compliance with them (88% versus 92%). Furthermore, the article Parker. MJ. et al.[8] obtained that measures between healthcare personnel are considered most effective are: use of isolation rooms (4.6 of 5 points with p: 0.02 95% CI: 4.5-4.8) respirator (4.5 / 5 p. 0001 p5% CI: 4.3-4.6) and handwashing (4.6 with p: 0.03 95% CI: 4.4-4.7) and with respect to the latter, the doctors informed wash his nurses and auxiliary (4.9 v 4.5 and 4.5, respectively; p '0.05).

In the study of LA Nickell. et al.[6] is seen as respondents who considered the SARS high risk to public health reported greater compliance with handwashing (4.8 v 4.4) always mask utilization (3.9 v 3.2) and gloves (3.6 v 2.9) with p '0.05), gowning (4.9 v 4.7) or mask when examining patients (5.00 v 4.8). Instead eye protection (3.4 v 3.0) is not considered necessary addition, the use of a respirator caution was most frequently cited as most annoying and so considered it, 92.9% described it as a physical discomfort.

With respect to other preventive measures, Articles Wong WCW. et al.18 and CC Hsu et al.[2] discuss disagreements enforce quarantine measures. In his study in Taiwan during the SARS pandemic to 312 nurses, objective nurses were less likely to cooperate with quarantine measures when they had less knowledge about SARS (OR 3.66 95% CI. 1.99-6.75) when expressed less fear (OR 3.19 95% CI. 1.85-6.21) and when not working well health centers (OR: 2.16 95% CI 1.17-4.00). With regard to information on pandemics, there is controversy regarding the sources used to obtain it. L. Vinck et al.[16] in their study objective that 48% looked at the information center of reference. Instead, La Torre G et al.[4] in a work on the SARS pandemic in which he compared the behavior and attitude of physicians in general population, stresses that the main source of information for physicians were internet (41.5%) and the second hospital internal (33.1%) while the rest of the obtained television population (34.1%) followed by internet (30.9%). Another important fact based on the information we found in the study of L. Vinck et al.[16] in which it is found that between 71-97% of all health personnel informing patients about protective measures. However Tolomiczenko GS. et al.[13] found that nurses were less informed and less involved in decision-making and were the most indicated that preventive measures were not strict enough.

An important point also found to do this review, is the question of the lack of training, something that is spoken in two of the articles included in this review. Wong ELY. et al.[17] in their study of nurses during the swine flu pandemic, says that 76.9% of them do not want to work, and 43.6% are not trained to care for patients with influenza. Something similar, but referred to the medical staff, is what is Wong WCW. et al.[19] to compare doctors in Hong Kong and Toronto during the SARS pandemic, aiming to 84.6% and 80.0% of Hong Kong and Toronto respectively lacked training in infectious disease control (68.1% and 73.5% respectively); and this fact was that they were more likely to request more complementary tests, especially doctors Hong Kong (OR 37.8, 95% CI 12.65-113.06).

The perception of the pandemic, both positive and negative factors the same, and agree or disagree with preventive measures is a recurring theme in several of the articles reviewed. So, Tan WM. et al.[12] in their study notes that 84% of respondents agreed with the action taken. However when the question focuses only on the medical population, their work is that 72% of doctors say the measures negatively influenced their working day. And 34.6% of them described it as excessive and exaggerated.

Hsu C-C. et al.[2] speaks of the lack of confidence of nurses to the pandemic and the preventive measures taken by noting that 71.9% of them showed a general lack of confidence. Also found three factors that this is associated: the greater perceived severity (OR: 0.58 with IC.95% from 0.35 to 0.99), daily performances epidemic (OR: 2.6 IC.95% 1.28-3.98) and number of cases in the community (OR: 2.1 IC.95% 1.13-4.31); in contrast with this, Nickell LA. et al.[6] also says in a study conducted during the SARS pandemic, most health workers who took part in the study were as adequate preventive measures taken (74.1% of the sample). The author also mentions in his study of the three negative effects that the pandemic has had as health personnel including financial losses, the feeling of being treated differently by the general population to work in a hospital and the change in the style of personal and family life he had led.

Among the changes in lifestyle, health workers mostly speak during the pandemic try to avoid attending public spaces and avoid contact with family or friends. But not only talk about the negative of the pandemic, workers also found positives in the pandemic, 58% of them reported at least one positive effect. The positive effects most frequently mentioned are feeling greater awareness of disease control (41.1%), the finding of the pandemic as a learning experience (26.4%) and a greater sense of unity and cooperation (23.8%). Associated with these positive effects, especially at greater sense of unity and cooperation are the results found by Wong WCW. et al.[19] This author finds that Family Physicians of Hong Kong and Toronto SARS not associated with loss of income, whether either a greater willingness and commitment either by the degree of satisfaction in handling SARS, showing that in both countries were willing to take responsibility and get involved.

In two of the seventeen articles reviewed the risk of contagion and risk perception thereof by the health sector are mentioned. Nukui Y. et al.[7] studied the risk of infection during the influenza pandemic among different groups of health workers and finding no increased risk of seropositivity (OR: 5.25) between nurses and doctors as well as pediatric staff, emergency and internal medicine (OR: 1.98). Shiao JS-C. et. al.[11] refers to the risk perception of it during the SARS pandemic and gets a 71.9% perceived risk of infection, 32.4% felt that people avoided them for their work and 7.4% seriously considered abandoning his post work.

Joining Vaccination Programs

Three of the nine articles that talk about swine flu vaccination mentioned. Tanto H. Seale et al.[9] in their study of vaccination among health care workers in Beijing, and Torun SD. et al.[14] in a very similar study but in Istanbul, speak vaccinated similar percentage (25% and 23.1% respectively). In both studies agree that the possible side effects are the most influential factor on adherence to vaccination (61% and 76.1% respectively) Regarding the sector population vaccine more both Torun SD. et. al.[14] as La Torre G. et al.[4] agreed that the group of doctors vaccinate more compared to the rest (X^2: 20,23). Torun SD. et al.[14] also objective that 59.9% of doctors recommend vaccination to their patients.

CONCLUSIONS AND DISCUSSION

We have not found any systematic review published to date that values the behavior of health professionals in pandemic situations. In our review the level of evidence found according Sign Criteria is three as it is in all cases of cross-sectional studies. So although it does not involve a higher level of evidence provides information on areas for improvement to future health emergencies. Table 10 summarizes the main findings and limitations found in each article and progress found by the authors.

Table 10. Conclusions drawn from the work performed

Evidence	Author	Ref.	Conclusions	Limitations	Advances
3	Alvaro J. Idrovo et al.	Rev Panam Salud Pública. 2011; 30(4): 361-9.	Response to the epidemic could have been better. Increased need for training in epidemiology	Intstrumento used was designed to assess staff responsabilidadde field epidemiologist	Identifying areas of opportunity to improve the teaching of epidemiology to health contingencies
3	Nukui Y. et al.	Infect Control Hosp Epidemiol 2012;33(1):58-62	Seropositivity H1N1 is a risk factor for occupational health personnel	Low levels of seroconversion reduce the power of the study to investigate relationship between exposure and use of PPE	Personal health is a priority group for vaccination against H1N1 because of the high risk of infection
3	Wong WCW. Et al.	J. Epidemiol Community Health 2004;58:180-185	General M. changed their clinical practice. They fault isolation measures of suspected cases of SARS spread increased their lack of contingency plan	small sample (representing 3-4% general practitioners). Type of study.	SARS exposed the weaknesses of the health system of Hong Kong and the need to change health policy and clinical practice
3	Seale H. et al.	Vaccine 29(2011) 1605-1610	Contrary to previous studies that had reported the high predisposition to receive the vaccine this did not happen	Questionnaire (bias in the interpretation of data) Sample not representative for the rest of population.	Need for nursing staff aware of the need for vaccination
3	Sebahat D. T. et al.	Vaccine 28(2010) 5703-5710	Vaccination against H1N1 is insufficient among health care workers.	Type of study, no complete response rate and advanced stage of the pandemic.	Need for training and scientific information regarding efficacy and safety of the vaccine among health workers
3	Shiao J. S. et al.	Nurs Etica 2007 Jan;14(1):5-17	During SARS pandemic almost 10% considered leaving their jobs	. 83% response rate. Type of study	It is necessary to provide emotional and professional support nurses during pandemics
3	Vinck L et al.	Euro Surveill.2011;16(7)	Excessive workload during the initial 3-5 months of the pandemic. Low levels of anxiety. Low levels of consulting the reference center.	Data collected at 9 months of the pandemic. More doctors than nurses	Impotance of making appropriate plans of preparedness for future epidemics. Need to temporarily increase the workforce.. Improve template training by health personnel
3	Wu Meng T et al.	Ann Acad Med Singapore 2010;39:303-6.	Perceived as excessive measures will be accepted if the disease has high mortality rates.	Small sample size	Faced with new pandemics whose lethality is unknown implementing preventive measures should be accompanied by important communication explaining the uncertainties of the authorities and benefits individual measures
3	Martin S. D et al.	Journal of Nursing Management 2011;19(1): 98-108	The family plays an important role in the will to go to work. Having EPIS. Pregnant women should not serve patients suspected / diagnosed influenza A.	Low diversity of the sample (race, ethnicity, gender). Mide intention. Biases.	Have appropriate PPE influences the willingness to go to work.
3	Wong ELZ. Et al.	Health Serv. Res. 2010 Apr30;10:107	Provide training and counseling increase desposición to go to work.	Type of study, not included marital status and family status. Only community nurses.	Need for training in controlling infection of nefermeria staff.
3	Verma S. et al.	ANN Acad Med Singapore 2004 Nov;33(6):743-8	Fear, uncertainty and stigma caused by SARS is associated with psychological distress among general practitioners.	Low response rate. Rating scale stigma of HIV SARS was modified. Type of study.	The psychological needs of healthcare workers should be explored and discussed during periods pandemic.
3	La torre. Et al.	Scandinavian Journal of Public Health, 2012; 40: 69-75	Lots of information propagated so chaotic (even a significant percentage of doctors with false beliefs and lack of infection, treatment...)	questionnaire answered by volunteers via internet	Need to take measures for further information and efficient communication
3	Chih-Cheng Hsu. et al.	Am J infect Control 2006; 34: 176-81	Individual risk perception of nurses and quick update on the information significantly affects levels of professional confidence (key point success in the deployment of quarantine, 71.9% more than 2 mees of duration of more of epiemia in relation to the real); reports received by nurses seemed outdated because the data were worse still and controlled the outbreak; Lower levels of confidence in places with fewer cases in the community	survey of nurses closely related to the pandemic and with over 10 years experience and not the rest	The inplantar future effective quarantine of the entire community and the importance that will have this attached to the great challenge in health burden associated with future health education programs.. Elaboration of particitativas future policies in such situations and so these can help control pandemics

Evidence	Author	Ref.	Conclusions	Limitations	Advances
3	M J Parker. Et al.	Emerg Med J 2006, 23: 349-353	eye protection perceived as moderately effective in protecting against SARS and thus was poor compliance. The concern of SARS as a health threat appears to have greater impact in meeting the perceived effectiveness of prevention measures. Discordance between perceived risk and compliance reporting.	Emergency personnel without documenting compliance in real time with SARS measures (reporting bias) study previously validated by small sample to assess objectively. Obtaining the results only pediatric area	Development control equipment less restrictive infections more acceptable for staff; need to study more and understand the psychosocial effects of SARS on hospital staff over time
3	Leslie A. Nkellic. et al.	CMAJ Mar 2. 2004; 170 (5)	2/3 of the person experiencing concern for their health or that of your family. 29% of respondents experienced emotional distress, according to the GHQ-12. Positive aspects of the SARS epidemic: the staff noted an increased awareness of infection control, you can still benefit from the hospital community in the future. Some respondents found that the situation provided a positive learning experience and a greater sense of unity and cooperation among hospital staff, which can provide an opportunity to continue to build stronger relationships.	low response rate (47%); possible response bias; staff quarantined or outside were not included and may be the most affected; using the GHQ-12 was limited to a portion of the sample; the study was conducted in a large hospital so the results may not be generalizable to other contexts; Financial effects of SARS underestimated (data from the beginning after implementation of control measures)	Increase in future briefings least weekly updated information. Trying to find strategies for hospitals to respond quickly to the concerns of nursing related to their concerns and the patients themselves
3	Tolomiczenko gs.et al.	Journal OF Advanced Nursing, 50(1), 101-110	Differences between groups and pattern of these differences illustrate the impact of polarization and stressful SARS was in a hospital with a small number of probable cases. The clear differences entregrupos defined by demographic variables, clinical professions and secondary roles suggest unimpacto SARS epidemic	In 1650 only 1,100 workers had a chance to respond and only 27% answers.	Need for precise implantation of information sources to avoid raising the alarm and false beliefs
3	Wong C. W.. Et al.	Am J infect Control 2007; 35: 50-5	Differences between two models perform SARS pandemic showing centralizing or Hong Kong (with its training and resource gaps) or the method of Canadian patients distrivuir all hospitals closing all non-urgent consultation (with consequent epera lists, sanitary chaos and massification of health centers) were the perfect size	participation bias	. Need support systems A. P. in the future besides communication and collaboration between these and hospital systems to better control epidemics in the future. Need to establish a mechanism for deploying personnel between institutions

In relation to vaccination among health professionals is demonstrated that seropositivity against H1N1 is an occupational risk factor among health workers (Nukui et al.[7]) and is therefore a priority group for vaccination of high risk contagion. Despite this vaccination levels are insufficient. You need awareness (Seale et al.[9]) to health on the need for vaccination and thus must receive training and information science (Torun et al.[14]) on the safety and efficacy of vaccines as the factors most commonly associated with rejection were concerns about its adverse effects and the belief that the vaccine had not been adequately tested. The acceptance of a new vaccine will be more successful when placed in the context of a pandemic because it is driven by it (Seale et al.[9]). Not available yet tested vaccine against SARS in humans although there are investigations in animal models.

Another important aspect is the low use by the medical staff of the scientific literature available (Torun et al.[14]; Vinck et al.[16]; Wong et al.[17] and La Torre et al.[4]). Although both pandemics WHO, CDC, the Ministries of Health of the countries and health centers themselves have guides available to the management of these diseases were underused. It is essential in the face of new pandemics that health will improve their training and for it to use resources with proven scientific literature evidence to avoid the alarm and false beliefs (Tolomiczenko et al.[13]). This training in epidemiology and health contingencies to be improved since the start of training during the time students (Idrovo et al.[3]).

In general preventive measures in the two pandemics were well appreciated and followed by professionals. A factor influencing acceptance is the lethality of the infectious agent. So the more lethal than the most effective infectious agent be perceived preventive measures (Parker et al.[8] and Tan et al.[12] WM). Another factor is the information provided by the authorities both in content and in form. Acceptance would be higher if it were accompanied by good communication explaining the uncertainty of the authorities and the benefits of individual preventive measures (Tan et al.[12] WM). This would increase the

use of PPE and its proper use. The monitoring would be greater if the training of health personnel (Vinck et al.[16]; Nickell et al.[6]) were improved, health policy and clinical practice (Wong et al.[18] WCW) developing more participatory policies (CC Hsu et al.[2]) and developing control equipment less restrictive infections (Parker et al.[8]).

In our review we found two articles by Wong WCW[18], [19]en relation to family physicians and their response to the SARS pandemic. The first explains how the SARS changed clinical practice of family physicians and the second relates how health centers became massive. Family physicians are a key group pandemics since often are the first to come into contact with patients without the means or personal protection measures that exist in hospitals and well ahead of a certain infectious disease that is a trivial process or a more serious case as may be the SARS is not possible by the huge volume of patients and the common presentation of infectious diseases. Thus it is necessary to support primary care systems and improve collaboration between them and hospitals (Wong WCW et al.[19]).

In many of the articles reviewed reference to the psychosocial impact of the pandemic on health workers and stigma that generates the rest of the population is made. During a pandemic, we have observed that there is an important workload increase has a negative impact on their quality of life, which generates stress, but this is increased if we add the concern spread of health and what more distress them is to infect their families. This makes them think in some cases even leave their job which would bring disastrous consequences for the rest of the population because there would be fewer health personnel willing to work the greater the demand of patients. It is necessary to explore the psychological needs and treat them well as giving emotional support to health workers during pandemics (Shiao et al.[11], Verma S et al.[15]) suitable. Proporcionar EPIS increase their perception of safety and instruct them in the proper handling (Martin et al.[5] SD). You also provide training to cope with the increase in labor demand (ELY Wong et al. [17]), which would make fewer workers the option of not going to work arise. The workload is a problem we›ve seen in these two pandemics but every year you can see with the arrival of seasonal flu. One solution is to temporarily increase the workforce (Vinck et al.[16]) at all levels despite the economic crisis or other aspects that influence the refusal to do so.

This review demonstrates that although between SARS and influenza A was several years the problems with the health sector and its modus operandi wrong in some respects and inadequate information provided by the authorities was repeated. We have not found scientific literature on these issues and Ebola, last pandemic that we are living, but have raised the same issues in relation to the lack of information provided by health authorities, inadequate training about the virus and its mechanisms transmission or proper use of personal protective equipment or even the availability of the same in health centers. Also the negative psychosocial effects for staff working in contact with patients have been relevant.

LIMITATIONS

The results of this review are limited by the characteristics of each revised labor shortages and discussed in all cases of cross-sectional studies with low scientific evidence. Besides the heterogeneity of the studies and the factors studied each not allow firm conclusions on any of the results. Another limitation is that although in both cases are infectious diseases that caused the pandemic can not overlap because it's different agents with different mechanisms of transmission and lethality and affected different populations.

ACKNOWLEDGEMENTS

The National Library of Health Sciences Health Institute Carlos III by articles and provided assistance with the literature search. A National School of Occupational Medicine and its director for their assistance in preparing this review.

BIBLIOGRAPHIC REFERENCES

1. Alenzi FQ. H1N1 update review. Saudi Medical Journal. 2010;31(3):235-46.
2. Hsu C-C, Chen T, Chang M, Chang Y-K. Confidence in controlling a SARS outbreak: experiences of public health nurses in managing home quarantine measures in Taiwan. Am J Infect Control. May 2006;34(4):176-81.
3. Idrovo AJ, Fernández-Niño JA, Bojórquez-Chapela I, Ruiz-Rodríguez M, Agudelo CA, Pacheco OE, et al. [Perception of epidemiological competencies by public health students in Mexico and Colombia during the influenza A (H1N1) epidemic]. Rev Panam Salud Publica. October 2011;30(4):361-9.
4. La Torre G, Semyonov L, Mannocci A, Boccia A. Knowledge, attitude, and behaviour of public health doctors towards pandemic influenza compared to the general population in Italy. Scand J Public Health. February 2012;40(1):69-75.
5. Martin SD. Nurses' ability and willingness to work during pandemic flu. J Nurs Manag. January 2011;19(1):98-108.
6. Nickell LA, Crighton EJ, Tracy CS, Al-Enazy H, Bolaji Y, Hanjrah S, et al. Psychosocial effects of SARS on hospital staff: survey of a large tertiary care institution. CMAJ. 2 March 12, 2015: 2004;170(5):793-8.
7. Nukui Y, Hatakeyama S, Kitazawa T, Mahira T, Shintani Y, Moriya K. Pandemic 2009 influenza A (H1N1) virus among Japanese healthcare workers: seroprevalence and risk factors. Infect Control Hosp Epidemiol. January 2012;33(1):58-62.
8. Parker MJ, Goldman RD. Paediatric emergency department staff perceptions of infection control measures against severe acute respiratory syndrome. Emerg Med J. May 2006;23(5):349-53.
9. Seale H, Kaur R, Wang Q, Yang P, Zhang Y, Wang X, et al. Acceptance of a vaccine against pandemic influenza A (H1N1) virus amongst healthcare workers in Beijing, China. Vaccine. 11 February 2011;29(8):1605-10.
10. Shapiro SE, McCauley LA. SARS update: Winter, 2003 to 2004. AAOHN J. May 2004;52(5):199-203.
11. Shiao JS-C, Koh D, Lo L-H, Lim M-K, Guo YL. Factors predicting nurses' consideration of leaving their job during the SARS outbreak. Nurs Ethics. January 2007;14(1):5-17.
12. Tan WM, Chlebicka NL, Tan BH. Attitudes of patients, visitors and healthcare workers at a tertiary hospital towards influenza A (H1N1) response measures. Ann Acad Med Singap. April 2010;39(4):303-4.
13. Tolomiczenko GS, Kahan M, Ricci M, Strathern L, Jeney C, Patterson K, et al. SARS: coping with the impact at a community hospital. J Adv Nurs. April 2005;50(1):101-10.
14. Torun SD, Torun F. Vaccination against pandemic influenza A/H1N1 among healthcare workers and reasons for refusing vaccination in Istanbul in last pandemic alert phase. Vaccine. 9 August 2010;28(35):5703-10.
15. Verma S, Mythily S, Chan YH, Deslypere JP, Teo EK, Chong SA. Post-SARS psychological morbidity and stigma among general practitioners and traditional Chinese medicine practitioners in Singapore. Ann Acad Med Singap. November 2004;33(6):743-8.
16. Vinck L, Isken L, Hooiveld M, Trompenaars M, Ijzermans J, Timen A. Impact of the 2009 influenza A(H1N1) pandemic on public health workers in the Netherlands. Euro Surveill. 2011;16(7).
17. Wong ELY, Wong SYS, Kung K, Cheung AWL, Gao TT, Griffiths S. Will the community nurse continue to function during H1N1 influenza pandemic: a cross-sectional study of Hong Kong community nurses? BMC Health Serv Res. 2010;10:107.
18. Wong WCW, Lee A, Tsang KK, Wong SYS. How did general practitioners protect themselves, their family, and staff during the SARS epidemic in Hong Kong? J Epidemiol Community Health. March 2004;58(3):180-5.
19. Wong WCW, Wong SYS, Lee A, Goggins WB. How to provide an effective primary health care in fighting against severe acute respiratory syndrome: the experiences of two cities. Am J Infect Control. February 2007;35(1):50-5.
20. Centers for Disease Control and Prevention [Internet]. [Aforementioned 24 January 2015]. Recovered from: http://www.cdc.gov/
21. Instituto de Salud Carlos III [Internet]. [citado 26 de enero de 2015]. Recuperado a partir de: http://www.isciii.es/ISCIII/es/contenidos/
22. OMS | Organización Mundial de la Salud [Internet]. WHO. [citado 24 de enero de 2015]. Recuperado a partir de: http://www.who.int/es/
23. STROBE Statement: Home [Internet]. [Aforementioned 26 January 2015]. Reovered from: http://www.strobe-statement.org/