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| Study No | Author | **Risk factors/Correlations/ Findings** |
| 1 | Mian-Yoon Chong et al | 1 -The average IES score was-34.8(SD=19.7).The score was high in 1)men 2)Technicians 3) those with less than 2 yrs of experience 4) in the repair phase 5) those living without their family.2)CHQ score for psychiatric morbidity was higher in repair phase 80.6%,women and those who cared SARS patients . No difference seen in both the scores in relation to age and marital status. |
| 2 | Rober G Maunder et al | The prevalence of adverse outcomes were higher in the exposed group in comparison to the control: **1) Psychological distress**-(44.9% Vs 30.2 %, P < 0.01) **2) Post traumatic** stress - (13.8 % Vs 8.4 %, P 0.06) **3) Burn out** - (30.4 % Vs 19.2 %, P 0,003) **4) Increased smoking and alcohol use-** ( 21 % Vs 8.1% P 0.001 ). **Correlation** -1) Maladaptive coping and perceived adequacy of training together with protection and support explained the 18% variance in burn out, 21% in post traumatic stress. Maladaptive coping and attachment anxiety together with a protective effect of experience explained 31% of the variance in psychological distress. Exposure to high intensity and high risk work areas(ED, ICU) and direct exposure to infected persons were not the primary determinants of adverse outcomes. Perceived adequacy of training, moral support were associated with better outcome. Personal variables that contributed to adverse outcomes were maladaptive coping through avoidance, hostile confrontation and self blame. |
| 3 | Lesli A.Nickell et al | 29 % experienced emotional distress (This is more than double the number seen in general Canadian population. **Correlation-** Factors significantly associated with the presence of emotional distress were 1) Nursing profession (adjusted OR 2.8, 95 % CI, 1.5-5.5), 2)Part time employment status ( Adjusted OR 2.6 , 95 % CI 1.2-5.4), 3) Life style affected by SARS outbreak ( Adjusted OR 2.2 ,95 % CI 1.4-3.5 ), 4) Ability to do one's job affected by the precautionary measures ( Adjusted OR 2.9 , 95 % CI 1.9-4.6 ) |
| 4 | Siew E Chua et al | **Correlation**-PSS score and negative psychological effects from SARS were highly significantly correlated (P< 0.001). Health care workers appeared to be protected from stress with significantly more positive psychological effect than controls (P 0.025). 94% of health care workers reported positive responses which includes : awareness of hygiene (85 %), focus on current affairs (77 % ), and awareness of danger ( 41%). 89 % of HCW also had negative sequel such as tiredness ( 71 % ), worry about health ( 59 % ) and fearing social contact ( 46 % ) . Those who were confident about infection control ( 74 % ) had lower stress level and fewer negative effects. |
| 5-A | Grainne M McAlanan | **Correlation-**Both group of HCWs had equally high perceived stress levels measured by PSS-10 at the peak of the disease. The mean score for high risk group was 17.0 SD 5.66 VS 15.9 SD 4.68 for the low risk group.1) The PSS ratings significantly correlated with age for the high risk group but not with education for both groups.2) Total negative psychological responses correlated with PSS ratings in both groups but overall both groups had higher percentage of positive (35.8%) responses compared to negative ( 14.6 %) responses.3)High risk group reported higher percentage of : fatigue 70.03% Vs 22.1 % , poor sleep 30.2 % Vs 7.40 %, worrying about health 57.3 % Vs 41.2 %, fear of social contact 41.7 % Vs 23.5 % |
| 5-B | Grainne M McAlanan | **Correlation-**After 1 year perceived stress level was significantly higher in high risk HCW than the control. (PSS-10 score 18.56, SD 4.91 Vs 14.81, SD 5.02).1) Perceived stress is not associated with age and education, but it is higher among men. 2)No difference among doctors, nurses and other HCWs 3)High risk HCWs had higher DASS 21 depression score ( Mean 4.89, SD 4.74 Vs 2.17 ,SD 2.57 ) and DASS-21 Anxiety subscale score ( 4.85 SD 4.25 VS 2.07 SD 2.5 P < 0.001 for both) in comparison with other group. 4) PSS-10 score significantly and positively correlated with DASS-21 depression subscale, DASS-21 Anxiety Subscale and DAS 21 total score , that is perceived stress was associated with higher levels of depression, anxiety and general psychological distress |
| 6 | YaMei Bai et al | 5% of met the criteria for acute stress disorder. C**orrelation-**  Hospital care workers reported significantly more Anxiety ( 17% Vs 8%), Insomnia (14%Vs 5%) and |
|  |  | Exhaustion was higher in HCWs (20% Vs 8%) than administrative staff.  Quarantine was the most related factor for the stress (OR= 4.077, 95 CI 1.148 -14.48).  62% reported feeling stigmatized & rejected in their neighborhood |
| 7 | Angelina O.M et al | 1) 20% of doctors & Nurses had PTSD (IES score ≥30).  **Correlation-** Those who perceived to have support from superiors & colleagues were least likely to have PTSD (P 0.003, OR 0.33).  Prevalence of psychiatric disorder (based on GHQ score of ≥5) : 35% for doctors, 25% for nurses. Correlation for psychiatric disorder: Doctors (p 0.026, OR =1.6, 95% CI 1.1-2.5) & single HCWs (p 0.048, OR -1.4, 95% CI 1.02-2.0) were at higher risk than nurses & married HCWs.  Those who had 1) support from superiors/ colleagues (OR= 0.35, p 0.03) 2) clear communication of directives / precautionary measures (p 0.020, OR = 0.51) 3) who felt work had become more important (p < 0.001, OR=0.34) coped better and less likely to develop psychiatric symptoms.  There was no significant difference in the prevalence of PTSD & psychiatric diseases between those who were exposed & those who were not exposed |
| 8 | E Poon et al | Anxiety scores ranged from 20-80. Mean anxiety score levels were higher in front line health care workers than among controls (51.1 SD.10.2 Vs 47.1 SD 10.6). **Correlation-** Scores among women, health care assistants & nurses were significantly higher than scores among doctors (P < 0.001) and administrative staff (P <0.001).  Those who were exposed to SARS patient had higher level of anxiety than who were not exposed to such patient.  Front line HCWs experienced more burnout symptom, had higher perceived risk of contracting or dying from SARS than controls. |
| 9 | Tai W. Wong et al | This study assessed the degree of distress (using 11 point likert scale), source of distress (18 item questionnaire) and coping ( by using brief coping questionnaire).  Mean over all distress level was 6.19(Doctors-5.91, nurses-6.52, Health care assistants-5.44).  **Correlation-** over all distress levels for nurses was significantly higher than for HCA (P <0.005) but for doctors. No difference in mean distress levels by age, gender, rank or year of experience.  Significant mean differences on all the variables of source of distress among 3 groups.  Scores for nurses were significantly higher than doctors in terms of all sources of distress -(P<0.01). Coping strategies Significant group difference on planning (p<0.001), self distraction (p<0.05) and behavioral disengagement (p<0.01).Doctors were significantly more likely than nurses to use planning: Nurses were significantly more likely to use behavioral disengagement. Correlation: Over all distress level is highly and significantly correlated with 6 sources of distress : Vulnerability /loss of control (r²=0.68) : Health of self (r²=0.62) : spread of virus (r²=0.60) :Health of family members (r²=0.59) :change in work (r²=0.46) :Being isolated (r²=0.45) . Over all distress level was weakly but significantly correlated with all the coping strategies. |
| 10 | William J Lancee | The incidence of new episode of -major depression: 4%, new PTSD: 2%, new onset of any other psychiatric disorder: 5%.where as prevalence of -PTSD: 2.9%, depresion: 10.5%, panic attacks: 6.0%. However the lifetime prevalence of any Depressive, anxiety, or substance abuse diagnosis was 30%. New episode of psychiatric disorder occurred among 7 (5%) HCWs.  Only one HCW who identified SARS experience as a traumatic event was diagnosed as having PTSD. New episode of psychiatric disorder was directly associated with h/o having psychiatric disorder before the SARS outbreak and inversely associated with years of experience and perceived adequacy of training & support. |
| 11 | KY Tham et al | The prevalence of posttraumatic stress was 17.7% & that for psychiatric morbidity was 18.8%.  **Correlation-** Fewer doctors had post event stress [5 (13.2%) Vs 12(20.7%)] & psychiatric morbidity [6(15.8%) Vs 12(20.7%)] compared to nurses. There was no correlation between demographic characters & post event stress or morbidity. **Comments**: 6 months after the SARS outbreak the rates of post event stress & psychiatric morbidity were relatively low among ED doctors & nurses |
| 12 | C-Y Lin et al | **PTSD prevalence**: 19.3% (score more than 40).  **Correlation-** age, gender, marital status, work load, no of children or family members had no correlation.  Self observation about the severity of stress caused by SARS was the only difference: 6.5 % of those who scored more than 40 opined Severity of SARS as extremely serious where as 68.8% felt serious and 25% felt mild.  **Psychiatric Morbidity**: **Prevalence** -47.78%.  **Correlations:** no difference in age, gender, marital status , work load, no of children or family members , history of physical or mental illness , quarantine due to SARS and self observation about the severity of SARS between who scored <3 & >3.  However there was significant difference in DTS-C score between ED staff (High risk group) and psychiatric ward staff (low risk group-who were taken as control). Average score was 26.03 for ED staff & 16.04 for low risk group (p 0.046). 21.7% of ED staff had DTS-C score more than 40 in comparison to 13.0% in low risk group (p 0.537).  No significant difference seen in average CHQ-12 scores between the two groups. 51.6% of ED staff had CHQ-12 score of >3 in comparison to 38.55 in low risk group ( p 0.371).  ED staff experienced the PTSD symptoms “acting & feeling as if the trauma were recurring” and irritability more severely and more often than the staff in the low risk group. Also the ED staff had more difficulty in getting along with the family or friends than the control group. |
| 13 | Cheng-Sheng Chen | **This study divided the subjects in to 3 groups**:  **Group1-** high risk group -those who originally worked in Units with a high risk of SARS exposure like ED/ICU/Medical units.  **Group 2**(21)-those who had been involuntarily conscripted into the high risk areas.  **Group 3**(45-low risk group- Controls) - Those who worked in units of low risk exposure.  IES was used to assess the post traumatic stress & SCL-R scale is used for measuring the psychiatric morbidity ( somatization / anxiety/depression/phobic anxiety etc).  **Post traumatic stress: overall prevalence** 11%, highest in high risk groups (17%), followed by group 2 (10%) and least in controls (2%).  Those who had post traumatic stress also found to have more severe symptoms measured by GSI scores (p<0.01) and 4 symptoms profiles of SCL-R -Anxiety (p<0.01), depression (p<0.01), hostility (p<0.01) and somatization(p<0.05).  There was significant difference between three groups in the total IES scores (p<0.05), intrusion subscale of IES (p<.05), avoidance subscale (p<0.05) & depression subscale of the SCL-90-R(p<0.05). The conscripted group nurses experienced more severe symptoms ( as measured by IES total score, intrusion & avoidance subscale,& SCL-90-R subscales of depression and hostility) when compared to controls as well as more severe symptoms ( as measured by the intrusion IES subscale & by the SCL-90-R subscales of depression and hostility) in comparison to high risk group. Nurses in the high risk groups also experienced more severe symptoms than the controls as measured by IES avoidance subscale.  COMMENTS: 1)11% had SARS related post stress reaction; highest rate is seen in the high risk group. 2) However severity of psychological symptoms were more in group 2 than high risk group.3) SARS related stress reaction syndrome included anxiety, depression, hostility and summarization. |
| 14 | Panagiota Goulia et al | **Post traumatic distress - prevalence**: 20.7% (97) had mild to moderate distress (GHQ-28 score>5) & 6.8 %( 32) had severe psychological distress (GHQ -28 score >11).  **Correlations:**1) Degree of worrying about A/H1N1 influenza pandemic was significantly associated with psychological distress (p<0.036).  2) The distress was 2.2 times greater among nurses & 4.5times greater among auxiliary staff when compared to medical & allied staff.  3) Work satisfaction was negatively associated with the distress. No difference seen with regard to age/gender/education level/living status.  4) Higher proportion of nurses (23.9%) and medical staff (12.3%) had GHQ -28 scores >5 as compared to allied (13.5%) and auxiliary staff (12.3%) ( p<0.03).  5) Similarly among subjects who had severe distress (scores >11) the number of nurses (8.6%) and medical staff (6.7%) were higher than allied (1.7%) and auxiliary staff (3.7%) (p<0.03). |
| 15 | Mohammed Al Ghoban et al | This study explored the psychological impact of MERS on emergency room physicians  1)42% felt that they are more stressed at work  2) 91.5% felt their work put them at risk of infection  3) 54% were afraid of contracting the infection from patients  4) 4.2% were willing to change their current job.  5) majority felt that their job would expose their families (85%), parents (83%) and friends (77%) to risk of infection |
| 16 | Atushi Sakuma et al | **PTSD in medical workers: Prevalence-** 6.6% (OR-4.0).  **Risk factors or correlations:** lack of rest (OR 4.41,P<0.05), dead or missing family members ( OR 5.29,p<0.01), near death experience(OR 6.38,P<0.05) & lack of communication (OR 3.7 p<0.01) were associated with PTSD in medical workers. However age, gender, dead or missing colleagues, supervisory status and displacement were not associated with PTSD. **Depression in medical workers**: **Prevalence** -14.3% (OR 4.2).  **Risk factors or correlations**: lack of communication (OR 3.11 p<0.01) , lack of rest (OR 2.93 p<0.001) mainly disaster related work & near death experience found as a risk factors . Whereas gender, supervisory status & dead or missing colleagues were not associated with depression in medical workers.  **Psychological distress in medical workers: Prevalence -**14.5% (OR 5.9).  **Risk factors or correlations**: lack of communication (OR 2.75 p<0.01), lack of rest (OR 2.31 p<0.05) & near death experience (OR 2.53,p<0.05) were associated with high psychological distress. Comments: The prevalence of all the 3 conditions was significantly higher in medical & municipality workers than fire fighters. Work related factors strongly associated with increased risk |
| 17 | Erol Armagan et al | This study evaluated the prevalence of PTSD in Turkish Red crescent workers who were deployed in Asian Tsunami. **Prevalence of PTSD:** 24.2%  **Correlation:** No significant difference seen in PTSD in relation to age/gender/profession/experience or previous disaster experience. However severity of PTSD measured by CAPS-1 score was significantly higher in women, nurses & in those who had less than 3 disaster experience. |
| 18 | Peng Kang et al | **Prevalence of PTSD:** 21.8% (compared to supporting forces local forces more likely to have symptoms of PTSD 28.6% vs 18.2% p =0.04.  **Correlations** : Symptoms were high in 1) females 2) age 40-50yrs old ( OR =5.35 ,95 % CI 2.85-12.75 p <0.001) 3) Tibetans 4) Nurses ( OR =5.87 ,95% CI 2.85-12.12, P <0.001) 5) who had been in serious danger ( OR=2.40 95% CI 1.26-4.59,p 0.008) 6) witnessed colleagues being seriously injured 7) witnessed seriously damaged houses 8) witnessed someones death or injury. The prevalence was low in who had received prior mental health training ( OR=0.22, 95% CI 0.11-0.43 ,p <0.001). |
| 19 | Elizabeth D.Battles et al | This was a pilot study done on ED nurses who responded to the Hurricane Katrina. One out of 5 nurses (20%) who responded had a score above 44 suggesting PTSD symptoms. Limitations - low sample size & low response rate |
| 20 | Peter G van der Velden et al | This study evaluated the predictability of smoking as an independent factor for post traumatic stress symptoms in Ambulance personnel exposed to the fireworks disaster.  Findings : Cigarette consumptions at T1( 2-3 weeks after disaster) independently predicted post traumatic stress symptoms at T2 ( 18 months after disaster)- 1) intrusion at T2 ,p 0.019 .2) Avoidance at T2 ,p 0.031. 3) Hostility symptoms at T2. 4) Depression at T2. Comments: the main limitation of the study was low response rate at T1 & unmeasured pre existing mental health conditions & coping abilities. |
| 21 | Monica Misra | Prevalence of PTSD- overall prevalence 4%.  Prevalence in those involved with response to the bombing was 6% (in controls 1% P <0.05). Overall prevalence of substantial stress-13%. (15% in those who were exposed & 9% in controls).  **Correlations :** 1)Positively correlated to working at the scene (particularly one site.2)Not related with age or gender 3) Not related to role or duration of employment 4) Not related to time of arrival/severity of causality/previous exposure/ available support measure |
| 22 | Laila Skogstad et al | This study investigated the prevalence & predictors of PTSS and perceived per traumatic strain in first responders (ambulance personnel, police & fire fighters**). Prevalence of PTSD**: overall 1.3% (Low) 1.1% of ambulance personnel had PTSD ( 2.7% in fire fighters & 0% in police P - not significant) ) & 3.4 % of Ambulance personnel had sub thresh hold PTSD ( 1.4% in Fire fighters & 1.3% in Police , P -not significant).  **Correlations:** Dissociation & witnessing the injured victims was an independent predictor of PTSS in ambulance personnel. |
| 23 | Bashir Al Najjar | **Prevalence of PTSD:** 69.4% of nurses (scores > 35).  **Correlation-**1)Positively correlated with experience ( Higher among nurses with 6-10 yrs of experience 2)Not related to age /specialization/Qualification or marital status 3)Most frequent symptom was intrusion (15.5 %) followed by avoidance (14.9%) and the least one was hyper arousal (11.4 %). |
| 24 | Nasser Ibrahim Abu Noor et al | **Prevalence of PTSD:** 89.8% (scores >35).  **Correlation/ Findinds-**1) Significant difference in IES-R score and sub score among doctors (mean 47.38) and nurses (54.85) p ≤ 0.005. 2)Significant difference in relation to education 3) Significant correlation between year of experience and avoidance 4) Females had higher level of stress than males ( 55.79 Vs 51.63) 5) No Significant difference in marital status 6) No significant difference in relation to place or living or place of work 7) Negatively correlated with age |
| 25 | Gad Lubin et al | This study evaluated the prevalence of Acute stress disorder (ASD) & PTSD in medical staff members (medics & medical doctors) who were exposed to the victims of violent incidents in the Judea & Samaria.  **Prevalence:** only one medic (0.62% overall & 0.70% of medics) developed PTSD where as 13 (8.1% -overall) developed ASD - 12 medics ( 8.5% of medics) & 1 -medical doctor ( 5.3% of medical doctors).  **Correlation-** Those who had ASD has seen greater number of deaths & had fewer years of experience when compared to ASD negative group. Whereas working under fire, having exposure to previous events or having personal acquaintance with the injured did not show any significant difference between the two groups. Comments: In this study the rate of prevalence of ASD & PTSD were low. Possible reasons:1) due to the process of selection & training of military medics ( who are chosen from a group of soldiers who are suitable for combat roles) 2) relatively long training period 3) They also go through a course in mental health facility during their training. |
| 26 | Megan A. Perrin et al | This study evaluated the prevalence & risk factors of probable PTSD across different occupations involved in rescue & recovery at WTC site. The sample size was 28,962 (Police-3,925: Fire fighters-3232: EMS& Med disaster personnel=1741: construction workers-4498: sanitation workers-1,798) .  **Prevalence of PTSD using PCL civial version cut off score** : 14.7% overall ( ranged from 6.2% in Police to 21.2% for unaffiliated volunteers), 14.1% in EMS & MED personnel, 14.3% in fire fighters & 7.2% in Police.  **Correlations: A)Symptoms :** Re experiencing & Hyperarousable reported more frequently than avoidable symptoms in medical personnel ( 33.3% re experiencing : 32.3% Hyperarousable : 20% **avoidance) .B)Risk factors** within Disaster Experience- 1)sustaining an injury was the only factor within disaster experience that increased the risk in all occupations 2) Evacuating from one of the WTC towers was associated with increased risk except in fire fighters. C)Work Experiences related to WTC- 1) strongest association was observed for tasks performed that were atypical of reported occupation. (Eg- fire fighting was associated with 2 fold increased risk of PTSD among EMS & police). 2)The probability of PTSD increased with longer duration of time worked at the site for all occupations except Police & also for those who started work on 11 t September compared to those started on 18th September .  **comments:** EMS & fire fighters were twice as likely to have current probable PTSD compared to Police : this may be due to prior training /screening procedure for selection of more resilient work force |
| 27 | Mayris P Webber et al | This study evaluated current burden of post 9/11 respiratory conditions & mental health conditions (probable PTSD & depression) and their co morbidities among employees of fire department of New York (consists of Fire fighters & EMS workers).  **Prevalence: 1) Probable PTSD:** Total 6.9% (752/10,943) , EMS : 6.5%(79 /1228) , Fire fighters : 7.0%( 673/9715). **2) Probable Depression:** Total 19.4 %( 2106), EMS: 18.6%(227), Fire fighters : 19.5%( 1879). **3) Probable PTSD with Probable Depression:** Total: 6.6% (715), EMS: 6.1%(74) , Fire fighters: 6.7%(641).  **Correlations:** 1) Arrival group 1 were 2.8 times ( 95% CI 2.0-3.8) more likely to have probable PTSD than the arrival group 4 . 2) Those with probable PTSD were at the WTC site significantly longer (mean- 4.6months, SD 3.1) than those without PTSD (mean - 4.1 months, SD -2.8 , P 0.002). 3)Those with probable depression were at the WTC site significantly longer ( mean- 4.4months, SD 3.0) than those without Depression ( mean - 4.1 months ,SD -2.8 , P 0.0006). 4)11.6% of arrival group 1 had both while only 4.1% of arrival group 4 had both the condition. |
| 28 | Jennifer Yip et al | Study evaluated the health burden among EMS workers of New York fire Department by using the physician diagnosed medical records.  **Prevalence: PTSD: Depression : Harmful alcohol use** -7.0 %: 16.7% :3.0%. ( Arrival group 1-13.8% :22.4% : 3.8% , Arrival group 2 - 8.3 %: 17.2 %: 3.9%, Arrival group 3 - 8.8 % :17.2 % : 4.2 % , Arrival group 4 - 4.1% : 14.6% : 1.6 %, Arrival group 5 - 5.2% : 13.4%: 4.1 %, unexposed group -2.4%: 11.5%: 1.5%).  **Correlations:** 1) Females have significantly higher prevalence of Probable PTSD ( 10.4% vs 6.1% p 0.0011) & probable Depression ( 23.5% versus 14.8% p <0.0001) when compared to males. 2) Arrival group 1 had significantly higher risks for probable PTSD (adjusted RR=7.0;95% CI 3.6 -13.5) & probable depression ( RR=2.3; 95% CI 1.6-3.1 ). 3) Arrival group 1 had significantly higher risks for probable harmful alcohol use. 4) Group 2,3,4 had significantly higher risks for probable depression & group 2,3,5 had significantly higher risks for probable PTSD compared to unexposed group. 5) Increased intensity of WTC exposure was associated with higher probable PTSD , probable depression & harmful alcohol use. |

**Table 5.** Showing risk factors and Correlation