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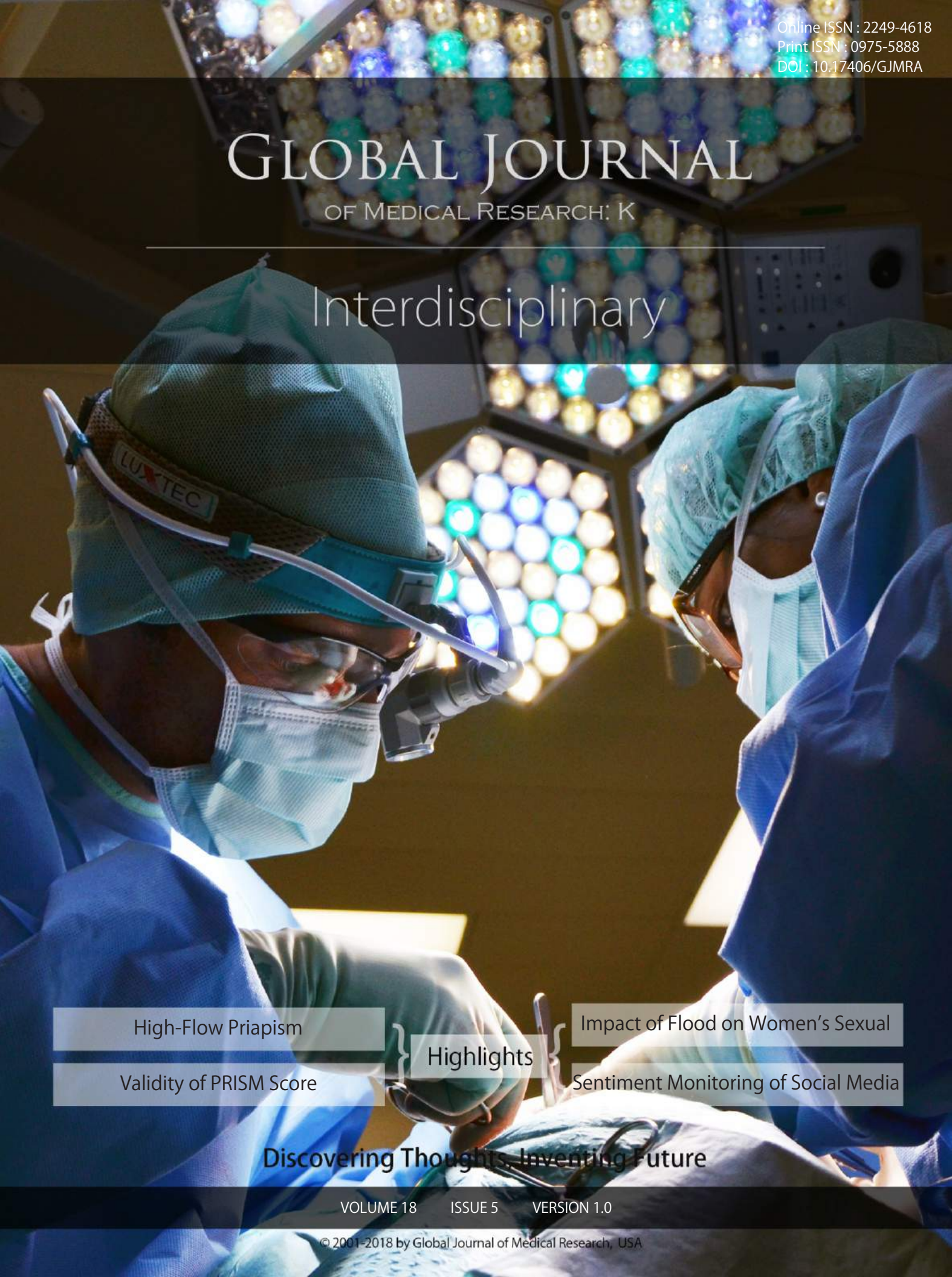

High-Flow Priapism

Validity of PRISM Score

Highlights

Impact of Flood on Women's Sexual

Sentiment Monitoring of Social Media

Discovering Thoughts, Inventing Future

VOLUME 18 ISSUE 5 VERSION 1.0

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Sentiment Monitoring of Social Media from Oceania

By Ross Sparks & Cecile Paris

Introduction- Social media platforms have experienced a major growth in the past few years, with people choosing to communicate, very often publicly, through social media. They disseminate information, opinions, and announcements. They also share a lot about themselves and their experiences. In particular, they often share information about how they feel. This potentially provides a wealth of information, in real-time, about the emotional state of individuals or communities. This can, in turn, provide valuable information about how people react to various events.

In our work, we have been investigating whether we can process emotion-related information from social media in real time, to understand how people react to different events and circumstances and potentially also help further research in mental health. To this end, we developed We Feel, a tool that analyses emotions on Twitter and presents them through an interactive visualization (see wefeel.csiro.au). We Feel constantly monitors the Twitter stream, looking for tweets (in English) containing any emotional content (Paris et al., 2015; Larsen et al., 2015). The platform aims at monitoring the regional elevated risks of suicide by assessing the mood of people in that region.

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Sentiment Monitoring of Social Media from Oceania

Ross Sparks [α] & Cecile Paris [σ]

I. Introduction

Social media platforms have experienced a major growth in the past few years, with people choosing to communicate, very often publicly, through social media. They disseminate information, opinions, and announcements. They also share a lot about themselves and their experiences. In particular, they often share information about how they feel. This potentially provides a wealth of information, in real-time, about the emotional state of individuals or communities. This can, in turn, provide valuable information about how people react to various events.

In our work, we have been investigating whether we can process emotion-related information from social media in real time, to understand how people react to different events and circumstances and potentially also help further research in mental health. To this end, we developed We Feel, a tool that analyses emotions on Twitter and presents them through an interactive visualization (see wefeel.csiro.au). We Feel constantly monitors the Twitter stream, looking for tweets (in English) containing any emotional content (Paris et al., 2015; Larsen et al., 2015). The platform aims at monitoring the regional elevated risks of suicide by assessing the mood of people in that region. Figure 1 shows a screen shot of We Feel. The set of emotions that are captured is shown on the left, displayed as an "emotion wheel". A map of the world is on the right. Both of these elements are interactive: one can select a region in the world, or a specific emotion, and the visualisation in the centre will focus on the chosen attributes (location or emotion) and change accordingly. In Figure 1, a specific date (May 21-27, the week of the Manchester attack), region (Oceania) and emotion (sadness) have been chosen. The visualisation shows the emotions as reflected in the tweets being processed, colour-coded by emotions, matching the wheel.

In this paper we use We Feel to explore the mood of the people in Oceania (Australia and New Zealand) over the period running from1 June 2014 to the end of November 2016.

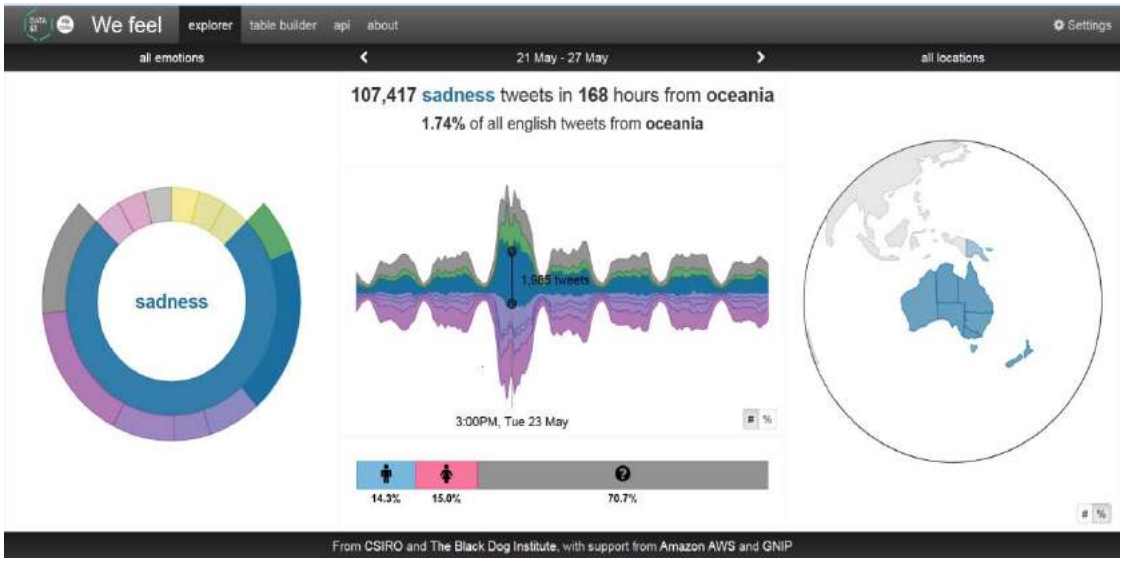

Fig. 1: We Feel: A Screen Shot of Emotional Tweets in the Oceania Region, May 21-27 (The Week of the Manchester Attack)

This paper uses statistical process control to flag significant changes in the mood of a region and understand its implication on the society in that region. We are interested in what events influenced the mood. An event may dominate the public conversation, so the number of people that talk about it increases significantly when it occurs, and then subsides as people either lose interest, all the issues of the event are covered, another event occurs that now captures

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people's interest, or life simply moves on. The monitoring technology in this paper is interested in isolating the dominant sentiment for an event. An event is determined by a significant increase of the number of tweets. The dominant sentiment for an event is found by monitoring the proportion of tweets with sentiments classified as expressing either anger, fear, surprise, sadness, joy or love. The final aim is to understand when people respond to events, why they respond with certain sentiments and how quickly does the event stop influencing the mood of people, or in other words how quickly do people move on with their lives after an event.

II. Event Detection

We start by detecting an event. As mentioned above, an event is defined as an unusual increase in the number of tweets per hour. We thus first need to define what is usual before we can establish what is unusual. We used the total tweets per hour (See Figure 2) as a response variable with explanatory variables lag logarithm hourly counts, time, harmonics to model both seasonal trends and within hour trends, and day-of-the week influences. Public holidays are ignored because the region does not have consistent public holidays. We assumed that the harmonic for season and day interacted. This model fitted quite well with the Pearson residuals showing no significant autocorrelation. The EWMA chart applied to the Pearson residuals of this model looked very strange with it mostly hugging the centreline and with no high-sided signal. Further investigation revealed that the lag 1 autocorrelation in the hourly counts was not very high at 0.54, and the coefficient for the logarithm lag counts in the fitted model was 0.308. This autocorrelation was driven by the events where counts ramped up. However, while they communicated with friends between events, there was no apparent autocorrelation until the next event. For this reason, we decided to fit the above model without the explanatory variable lag logarithm hourly counts included, and used this model to define usual behaviour. This meant that we would live with a slightly higher over-dispersion in the model than is justified, because we have included all events in the model without accounting for their autocorrelation, but we were happy to live with that and only focus on the major events.

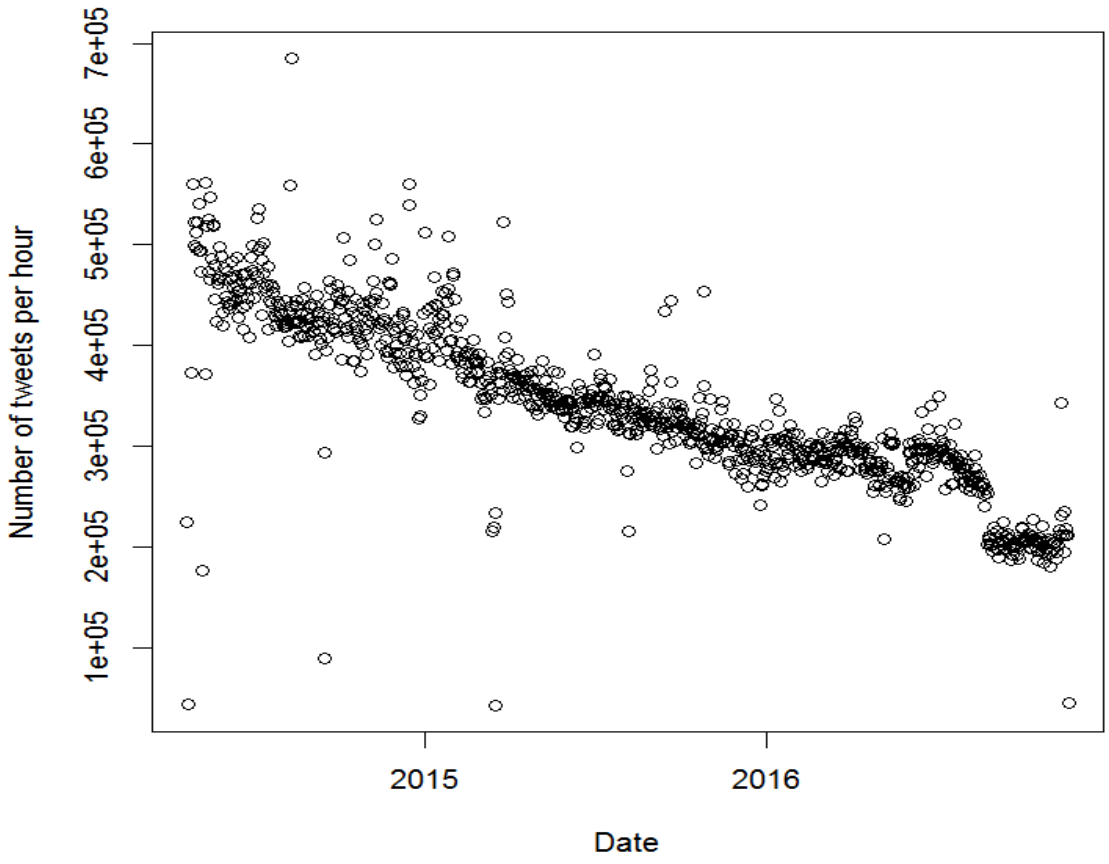

Fig. 1: The Scatter Plot of Tweet Counts Per Hour by Date

In such cases it is really difficult to define what usual behaviour is because there is no natural in-control situation. In this paper we define in-control behaviour as the predicted values using the negative binomial regression model below:

```
glm.nb(formula = Total ~ time + WD + (cos(2*pi*t/365.25) + sin(2*pi*t/365.25)) *
(cos(2*pi*h/24) + sin(2*pi*h/24)), data = tem, init.theta = 62.12038824, link = log)

Deviance Residuals:
     Min        1Q    Median        3Q       Max
-13.4576   -0.2731   -0.0150    0.2496    4.3130

Coefficients:
Estimate Std. Error z value Pr(>|z|)
(Intercept)    1.307e+01  3.129e-02 417.689  < 2e-16 ***
time-7.821e-04  2.506e-05 -31.208  < 2e-16 ***
WDMon                           5.360e-02  1.551e-02   3.457 0.000547 ***
WDSat                          -3.685e-02  1.559e-02  -2.364 0.018101 *
WDSun                           1.655e-02  1.556e-02   1.064 0.287497
WDThu                           1.297e-02  1.550e-02   0.837 0.402830
WDTue                           2.306e-02  1.548e-02   1.490 0.136168
WDWed                           1.885e-02  1.548e-02   1.218 0.223102
cos(2 * pi * t/365.25)        -2.222e-02  1.992e-02  -1.115 0.264726
sin(2 * pi * t/365.25)        -1.603e-01  3.474e-02  -4.615 3.94e-06 ***
cos(2 * pi * h/24)             5.380e-03  2.612e-02   0.206 0.836835
sin(2 * pi * h/24)            -1.817e-01  1.257e-01  -1.446 0.148266
cos(2*pi*t/365.25):cos(2*pi*h/24) 5.791e-03  1.988e-02   0.291 0.770840
cos(2*pi*t/365.25):sin(2*pi*h/24) 4.421e-01  9.518e-02   4.645 3.41e-06 ***
sin(2*pi*t/365.25):cos(2*pi*h/24) 1.502e-01  3.481e-02   4.316 1.59e-05 ***
sin(2*pi*t/365.25):sin(2*pi*h/24) 9.408e-01  1.690e-01   5.566 2.60e-08 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for Negative Binomial(62.1204) family taken to be 1)

    Null deviance: 3834.41  on 939  degrees of freedom
Residual deviance:  942.64  on 924  degrees of freedom
AIC: 22714

Number of Fisher Scoring iterations: 1

              Theta:  62.12
          Std. Err.:  2.86
```

Figure 3 provides the a qq-plot for the model indicating a reasonable fit to the negative binomial model except for outliers in the tail, which on the high-side would correspond to events of interest to Twitter users that cause the unusually high number of hourly tweets while this event holds the Twitter users' attention.

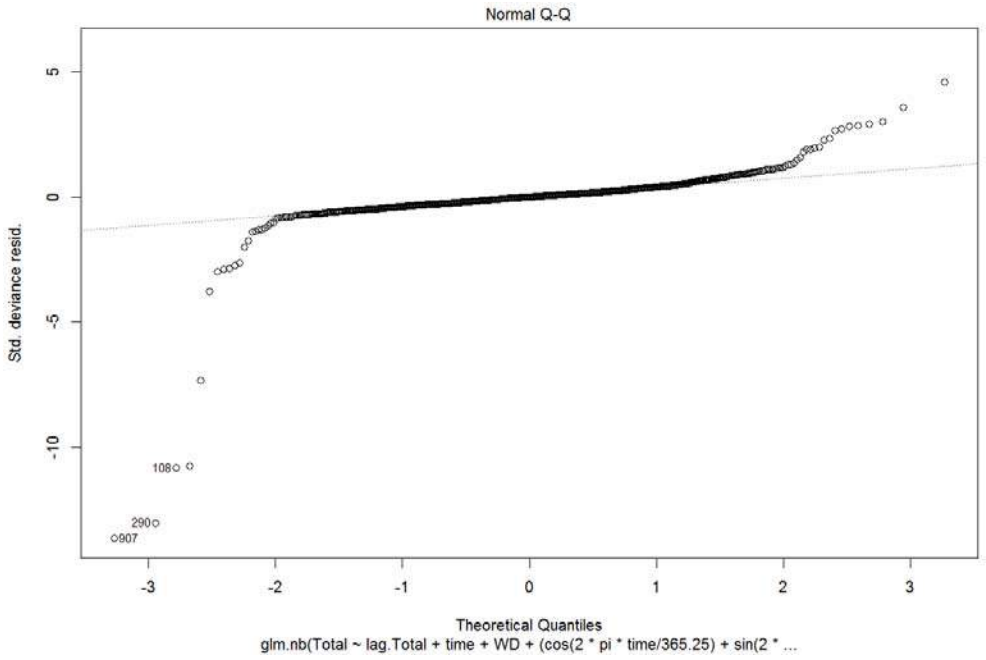

Fig. 2: QQ-Plot of the Standardised Residuals of the Fitted Model

These total hourly tweets appear to be over dispersed with a number of low and high sided outliers. We are interested in detecting the high sided outliers which we try to associate with a historical event that we believe created the significantly elevated interest amongst Twitter users. To achieve this, we apply the EWMA chart to the Pearson residuals for the model above. Firstly we establish the expected total hourly tweets by fitting the negative binomial regression model defined above. We estimate the Pearson residuals for this model and then apply the EWMA chart with exponential weights given by 0.4 because most events seem to wane very quickly in the social media context, and most of the events we are looking at are fairly large shifts. We believe that this is appropriate because most Twitter users' attention span is fairly short, seemingly less than an hour.

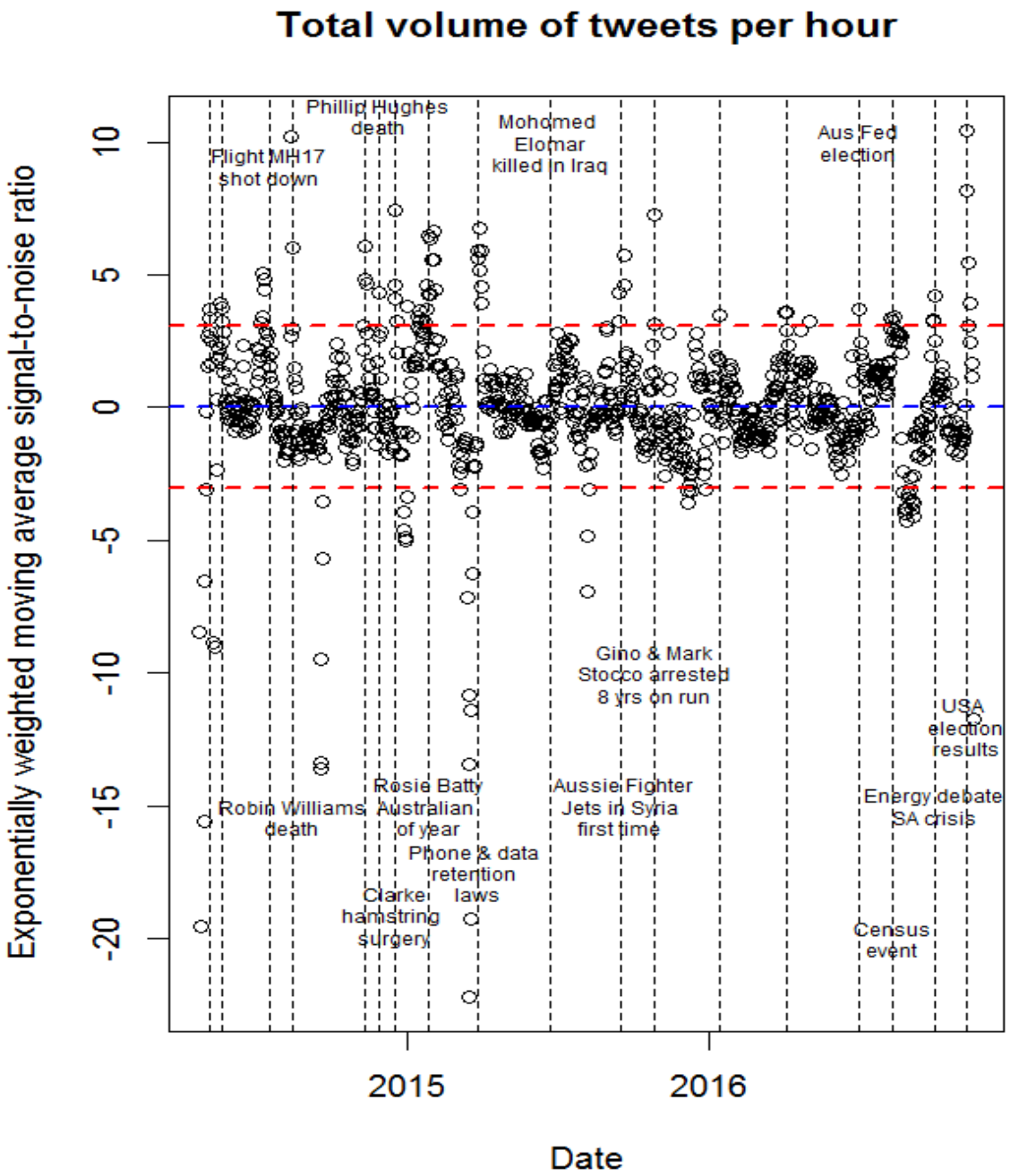

Fig. 3: Allocation of High-Sided Signals to an Event

We applied an EWMA control chart to the Pearson residuals to flag the unusual events of the study period using a retrospective surveillance approach. The in-control Average Run Length (ARL) for this EWMA was taken as 365 in designing the plan. The threshold was found by simulation, but we could have used the spc package in R (Knoth, 2017) to provide a very similar threshold. Since we are dealing with hourly data, this

gives us roughly 24 false alarms on average per year. Figure 4 provides the results of this chart by signalling unusual events: they occur outside the upper dashed red line either on the high-side or the low-side. We will ignore the low-sided signals in Figure 4 (events that trend below the red dashed line).

III. Understanding the Twitter Posts' Sentiments for the Events

Each tweet is classified as having one (or more) of the following sentiments: anger, fear, joy, love, sadness or surprise. We are interested in two cases: (1) when there is a change in sentiment independently of whether there is an event of not; and (2) to explore the sentiments for the events discovered in the previous section. In this section, we explore the first scenario. The second scenario demands a multivariate approach; it will be explored in the next section. Here, we are interested whether the sentiments change significantly over time independently. To carry this out we fit the following model using fear as an example. The modelling is then identical for all other sentiments.

```
glm.nb(formula = fear ~ lag.fear + time + (cos(2*pi*t/365.25) +
    sin(2*pi*t/365.25)) * (cos(2*pi*h/24) + sin(2 *
    pi * hr/24)) + WD + offset(log(Total)), data = tem, init.theta = 194.9292045,
    link = log)
Deviance Residuals:
    Min       1Q   Median       3Q      Max
-5.7578  -0.5889  -0.0798   0.4509   8.0048
Coefficients:
                                  Estimate Std. Error  z value Pr(>|z|)
(Intercept)                     -3.682e+00  2.938e-02 -125.338  < 2e-16 ***
lag.fear                         9.281e-06  1.693e-06    5.482 4.20e-08 ***
time                             1.958e-04  1.805e-05   10.847  < 2e-16 ***
cos(2*pi*t/365.25)                1.368e-02  1.139e-02    1.201 0.229639
sin(2*pi*t/365.25)                1.486e-01  1.985e-02    7.484 7.22e-14 ***
cos(2*pi*h/24)                  -6.053e-02  1.498e-02   -4.041 5.33e-05 ***
sin(2*pi*h/24)                  -1.477e-01  7.203e-02   -2.051 0.040285 *
WDMon                            4.683e-02  8.905e-03    5.259 1.45e-07 ***
WDSat                           -3.200e-02  8.923e-03   -3.587 0.000335 ***
WDSun                           -6.668e-03  9.103e-03   -0.732 0.463899
WDThu                            2.206e-02  8.847e-03    2.494 0.012645 *
WDTue                            3.884e-02  8.861e-03    4.383 1.17e-05 ***
WDWed                            4.554e-02  8.826e-03    5.160 2.47e-07 ***
cos(2*pi*t/365.25):cos(2*pi*h/24)-1.176e-02  1.136e-02   -1.035 0.300619
cos(2*pi*t/365.25):sin(2*pi*h/24)-1.938e-01  5.454e-02   -3.553 0.000381 ***
sin(2*pi*t/365.25):cos(2*pi*h/24)-1.463e-01  1.989e-02   -7.357 1.88e-13 ***
sin(2*pi*t/365.25):sin(2*pi*h/24)-6.184e-01  9.657e-02   -6.403 1.52e-10 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Dispersion parameter for Negative Binomial(194.9292) family taken to be 1)
    Null deviance: 1701.35  on 938  degrees of freedom
Residual deviance:  939.99  on 922  degrees of freedom
AIC: 14983
Number of Fisher Scoring iterations: 1
              Theta:  194.93
          Std. Err.:  9.18
 2 x log-likelihood:  -14947.14
```

Fear: The resulting EWMA chart for fear is included in Figure 5. This flags three events where fear was significantly higher than usual: (1) the Martin Place Siege, where a person held hostage 10 customers and eight staff of the Lindt cafe in the centre of Sydney, and two people were killed; (2) a cyclone that hit the state of Queensland in Northern Australia; and (3) the result of the USA elections. Notice that fear reduced significantly during Christmas 2014 and Christmas 2015, but not Chrismas 2016.

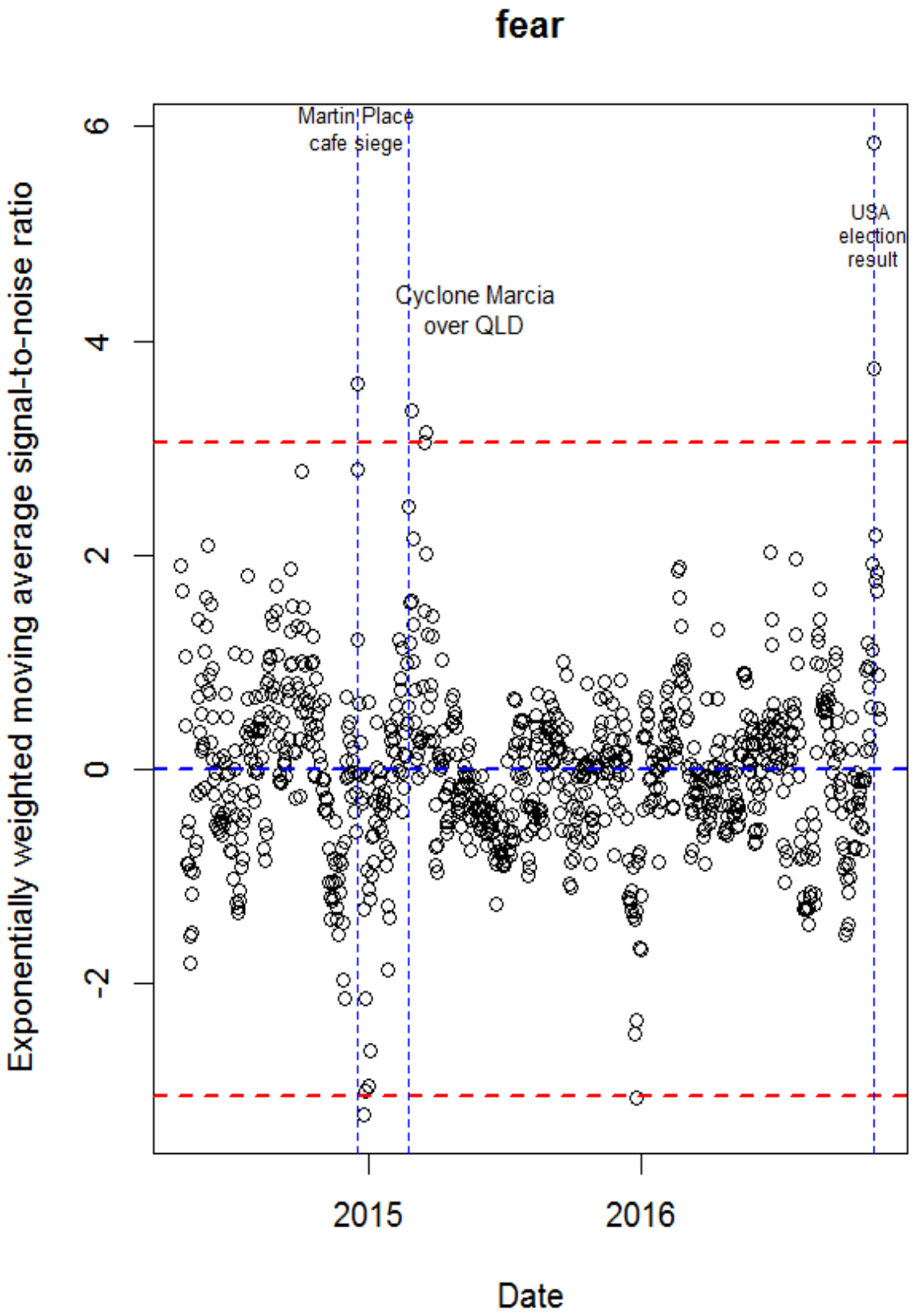

Fig 4: EWMA Chart for Fear

Anger: Figure 6signals days of unusual high proportions of anger amongst Oceania tweets. There are four unusual days: (1) a low proportion of angry tweets on Christmas day in 2014; (2) a low proportion of angry tweets on 16 March 2015, caused by an unknown event; (3) an increased proportion of angry tweets on 12 July 2015; and (4), again, on 9 November 2016.

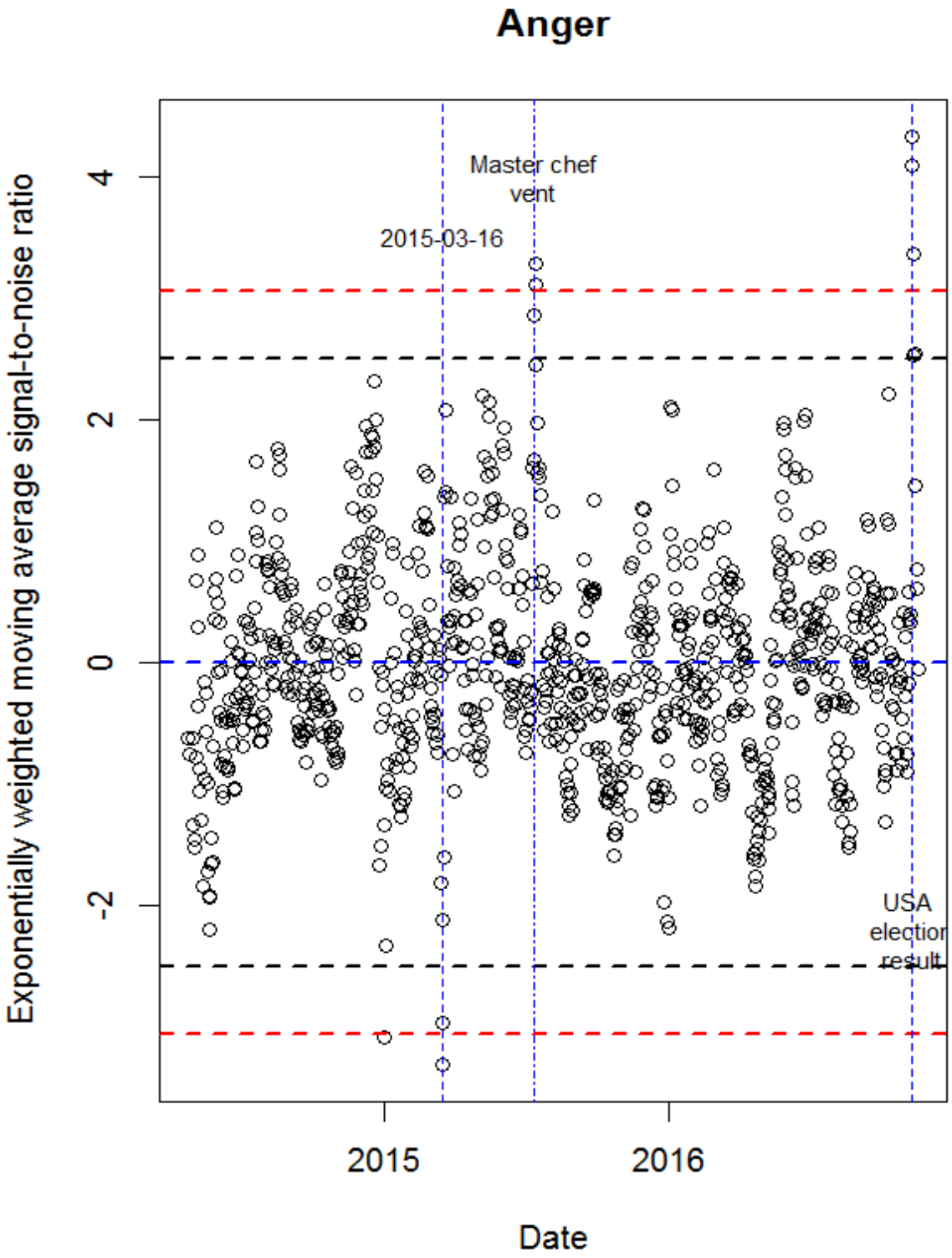

Fig. 5: Unusual Proportion of Tweets Expressing Anger

Surprise: Now we explore tweets that express a higher than expected proportion of tweets with sentiment surprise (see Figure 7). We see 7 peaks of surprises. The first surprise is, I am guessing, during the protests at the G20 summit in Brisbane. The second is when 2 of the Bali 9 drug smugglers jailed in Indonesia where executed by a firing squad. The third was Johnny Depp illegally smuggling his dogs into Australia from the USA. The forth is Penrith teenager caught with a gun in a school in a western suburb of Sydney. The fifth was Russia starting to attack ISIL in Syria. The sixth is the climate pact agreement, which seems to last a long-time when most other events seem to dissipate quite quickly. The last is a massive shift from low surprise to massive surprise on the BREXIT election outcome.

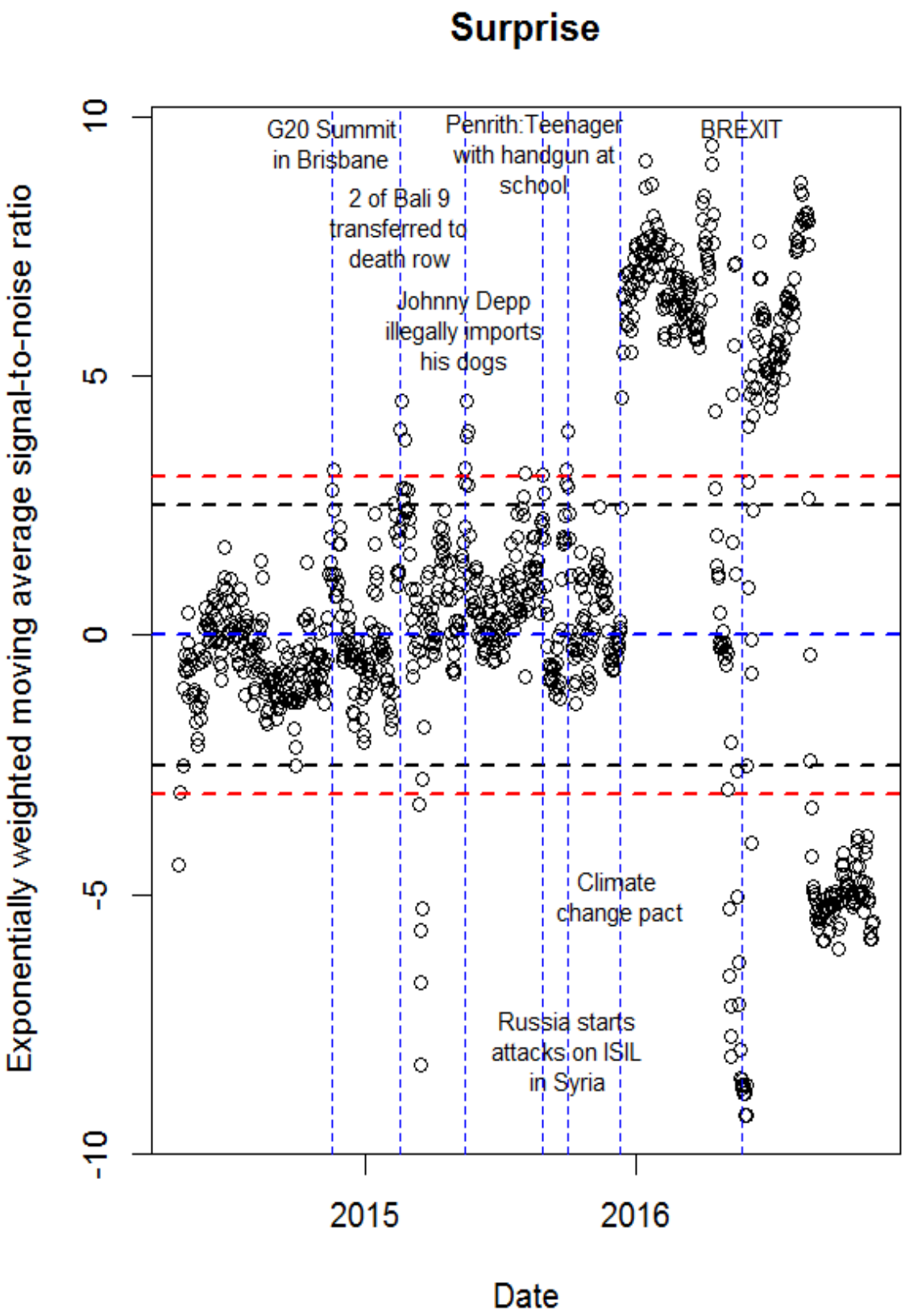

Fig. 6: Unusual Proportion of Tweets Expressing Surprise

Sadness: Figure 8showsthe unusual proportions of tweets that express sadness. The first is the shooting of Michael Brown; the second is the Martin place siege, although it is not signalled as unusual; the third is the German wings plane crash into the Alps; and the last Multiple attacks by ISIL.

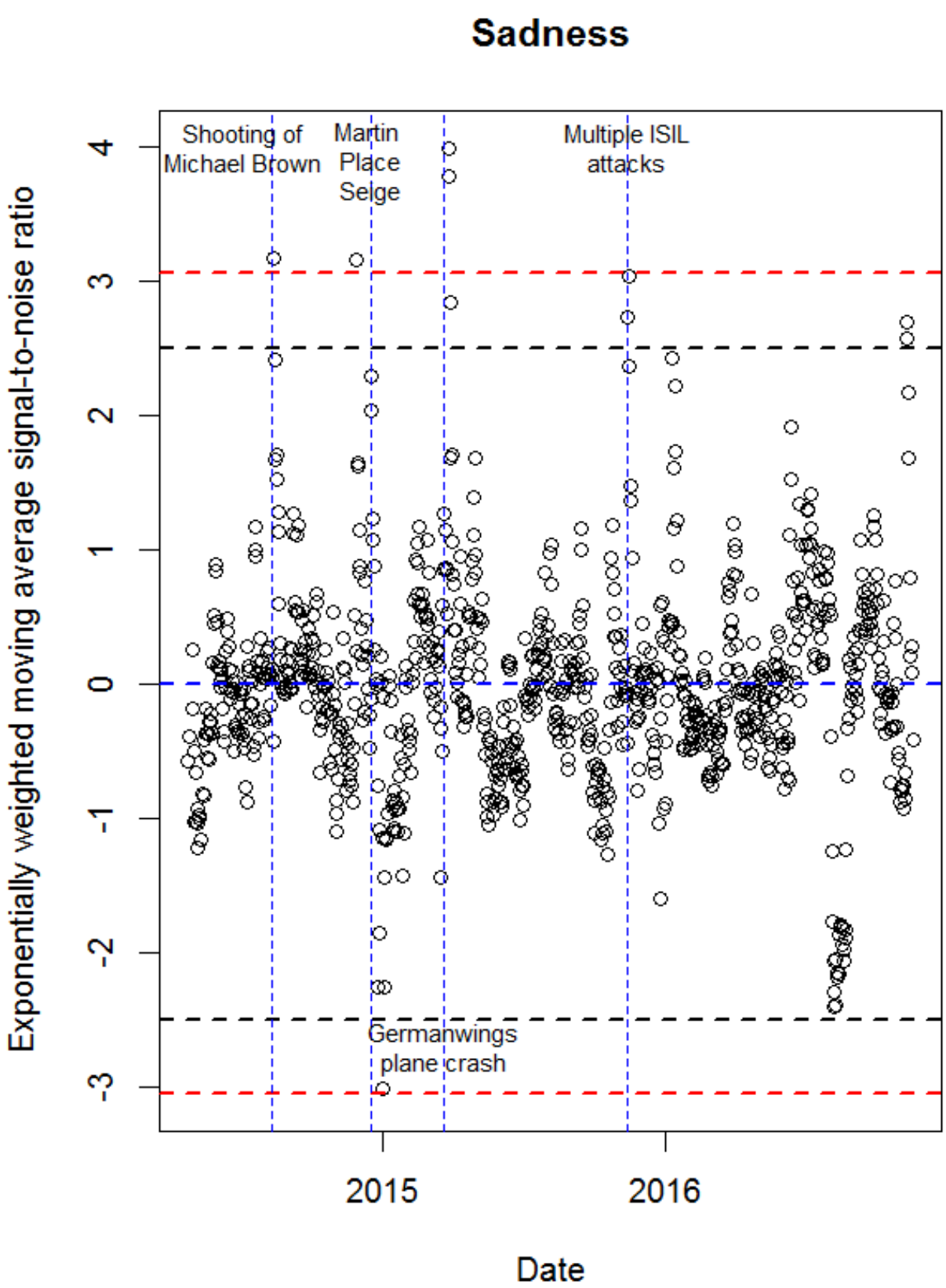

Fig. 7: Unusual Proportion of Tweets that Express Sadness

Love: Figure 9can be a little confusing. While I can see why Twitter users respond with love to the Duchess of Cambridge's birth of a child, on Christmas day with family and with a tribute to Malcolm Fraser, the other two peaks of love are less clear, unless sarcasm is being used.

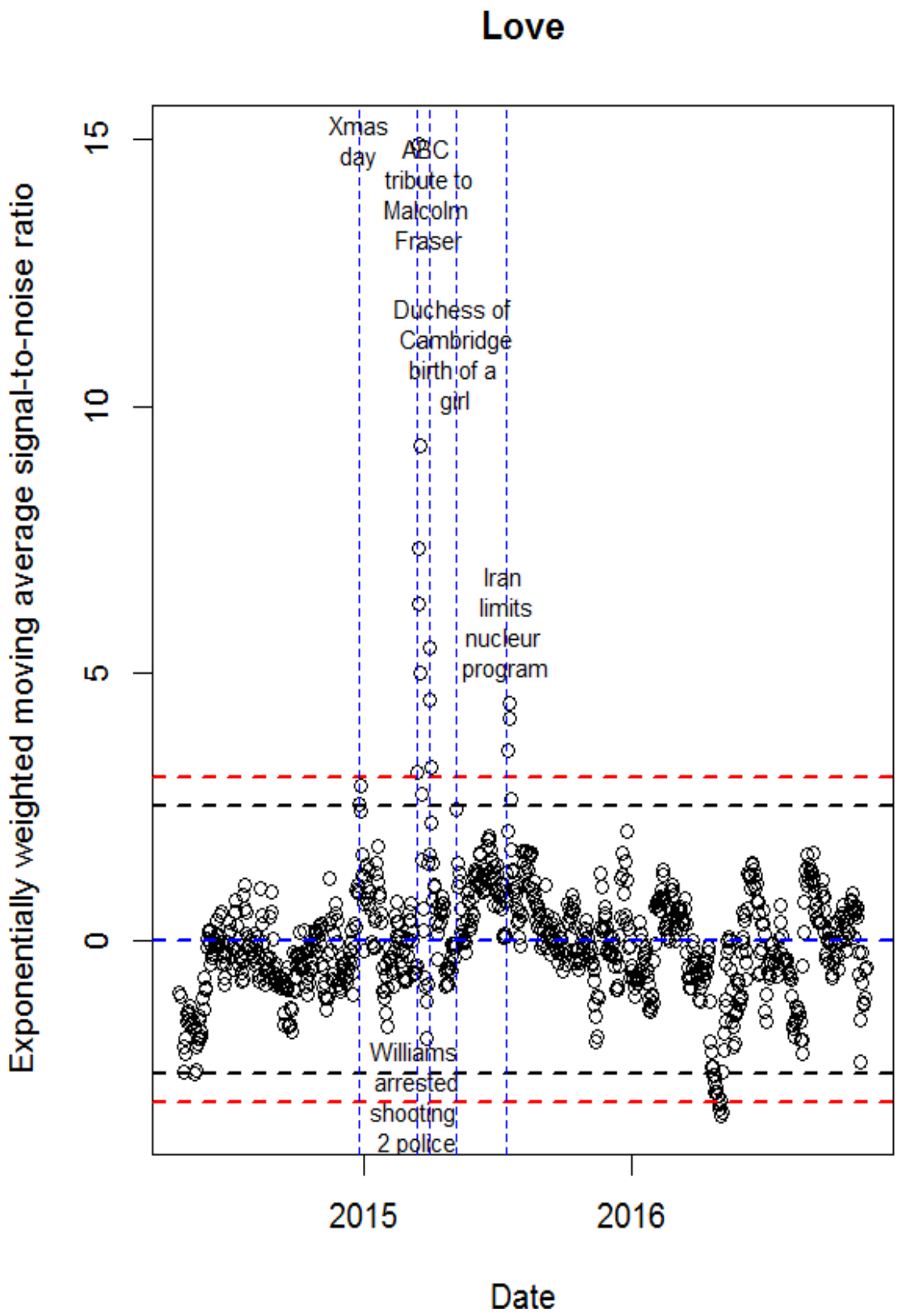

Fig. 8: Unusual Number of Tweets Expressing Love

Joy: Figure 10signals time with unusual proportion of Twitter users expressing joy in their tweets. Joy is expressed on ANZAC day in 2014; on Christmas day, followed by New Year's day and Australia Day (Public holiday). The others highlighted by vertical lines in the Figure fail to signal as unusual but showed trends towards being classified as unusual.

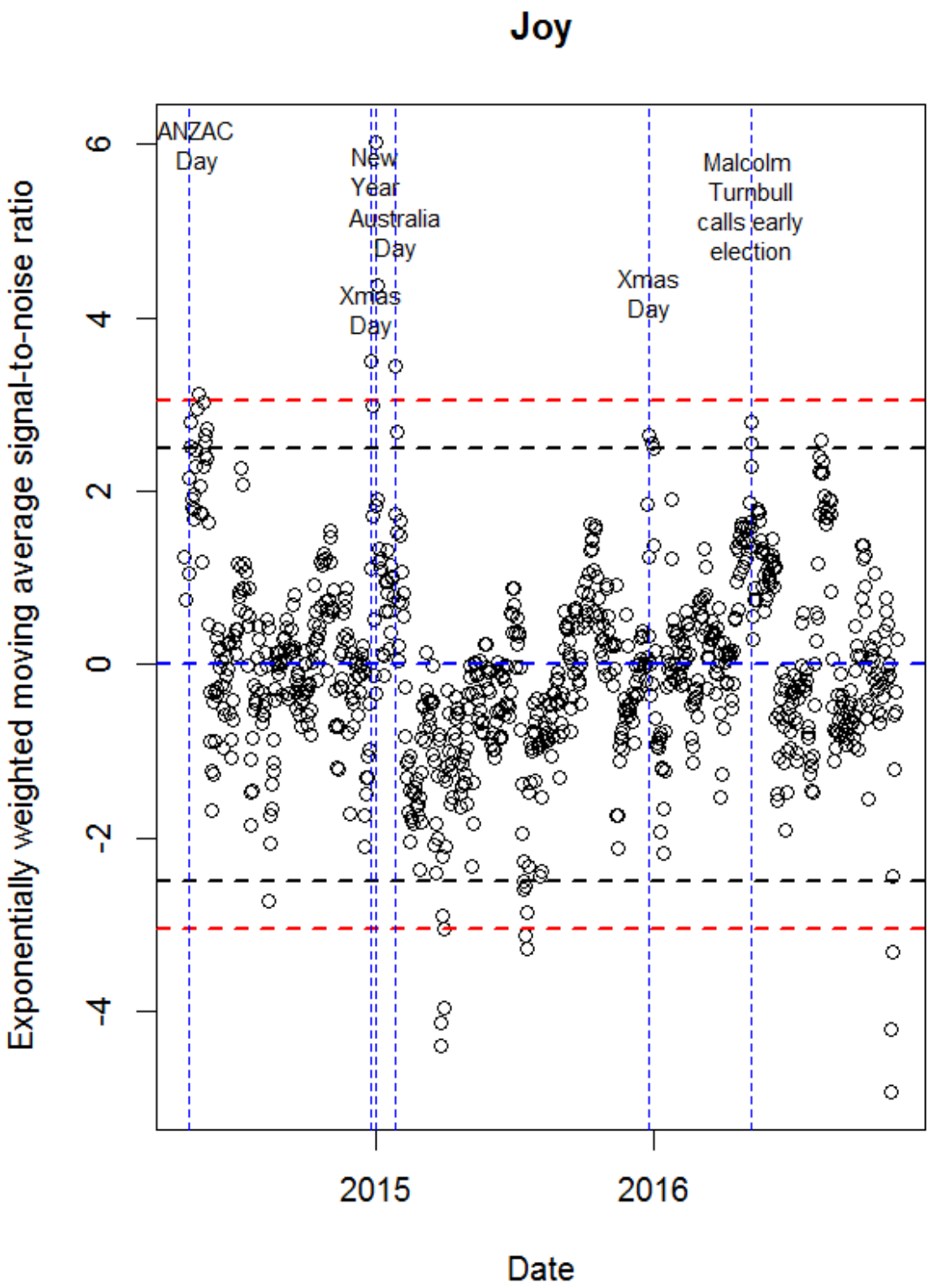

Fig. 9: Signalling Unusual Periods with Higher than Expected Joy than Expected

IV. Multivariate Views of the Sentiment Analysis

In order to understand the mood of Australians during the study period, we need a multivariate view of the sentiment monitoring process. The first multivariate view of the sentiment counts is achieved using parallel coordinate plots. An example is displayed in Figure 11. It displays the full list of sentiment counts for 6 days jointly using a parallel coordinate plot. This allows us to jointly view trends for all sentiment counts in a single plot, displaying trend information for all sentiment counts relative to their expected values. The lines go from black being the most recent date (14 November

2016), followed by red, green, blue, light blue, magenta and yellow (9 November 2016). The confidence bounds are the thresholds for the EWMA statistic for the sentiment scores. This plot helps us identify that there is a rough trend regional counts towards greater volumes expressing anger, fear and sadness and a reduction in joy and love. Note that love started with an unusually high number of counts This plot is easy to interpret and helps interpret the full picture of the sentiment scores. It does not, however, make the best use of the relationships between the variables/sentiments.

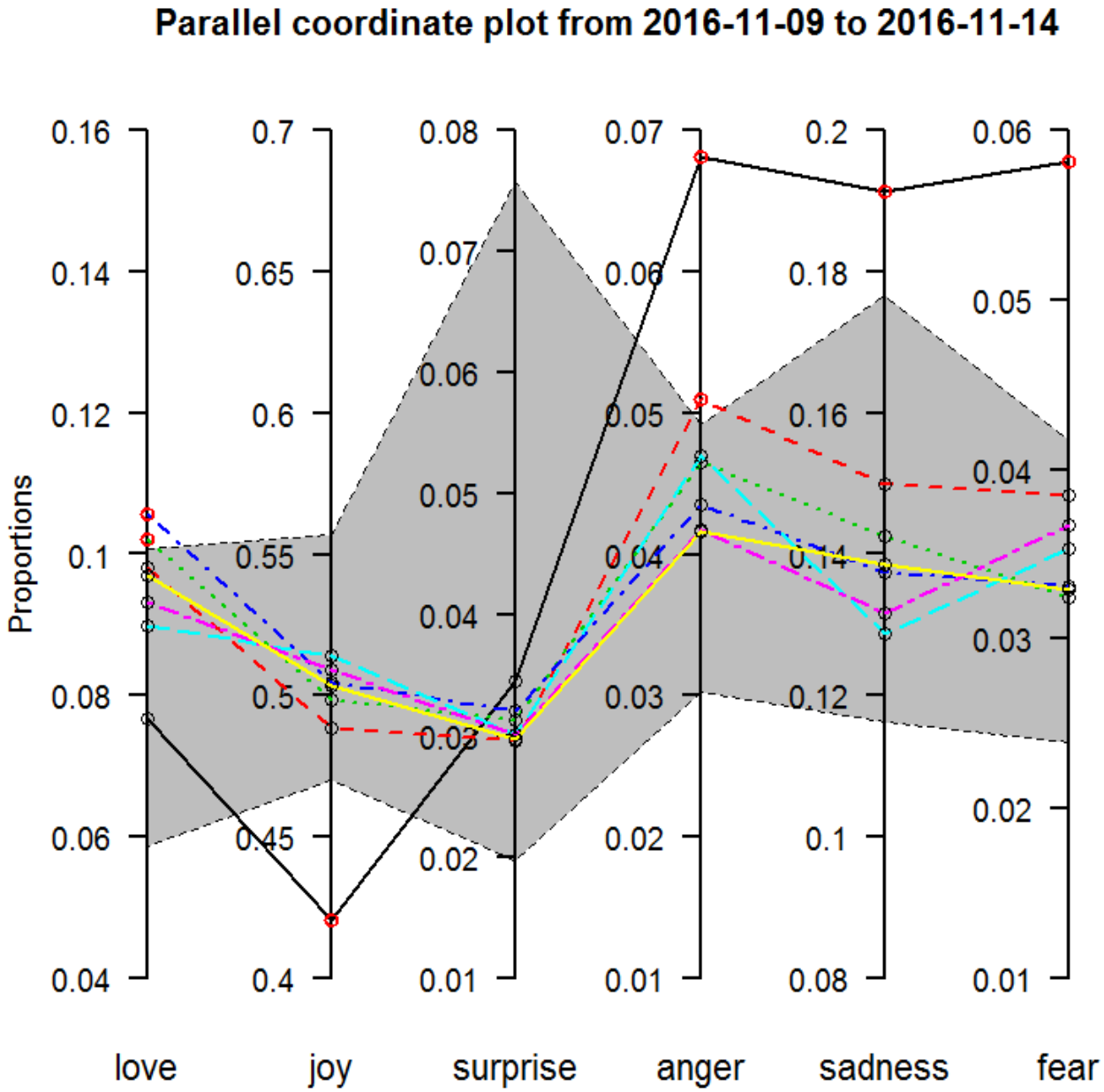

Fig. 10: The List of Sentiment Counts for 6 Days Jointly using a Parallel Coordinate Plot

To capture this relationship, we propose using the dynamic biplot of Sparks et al. (1997). It monitors changes in location of the counts as well as changes in correlation between the tweet counts and changes in dispersion of the counts in a single plot, making it quite useful in interpreting the Twitter users' responses to certain events. For example, Figure 11 describes the response to the shooting down of flight MH17 over Ukraine. Note that 85% of the variation is in two dimensional display; 58% in the first dimension and 27% in the second dimension. The overwhelming response is one of sadness and significantly reduced joy. There is a significant increase in fear and anger but this is roughly orthogonal to those that express sadness. Note that many people are expressing anger and fear at the same time, as we see that these two emotions are close to being collinear.

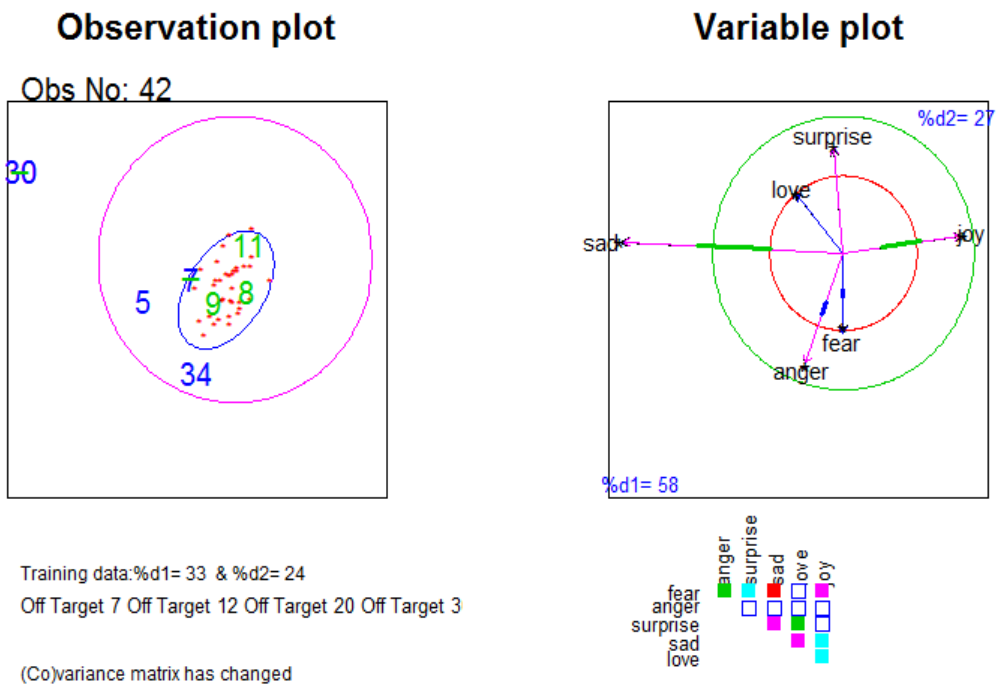

Fig. 11: Sentiment Analysis after Flight MH17 was Shot Down

How to interpret these plots is well covered in Sparks et al. (2017). Figure 13shows the response to Phillip Hughes's death by being hit on the head accidentally by a cricket ball. The figure indicates a significant increase in anger and increased sadness. There was also a simultaneous reduction in the expression of joy, mostly from those that expressed sadness. The correlation between these sentiments counts have not changed significantly by the colours in the matrix below the variable plot.

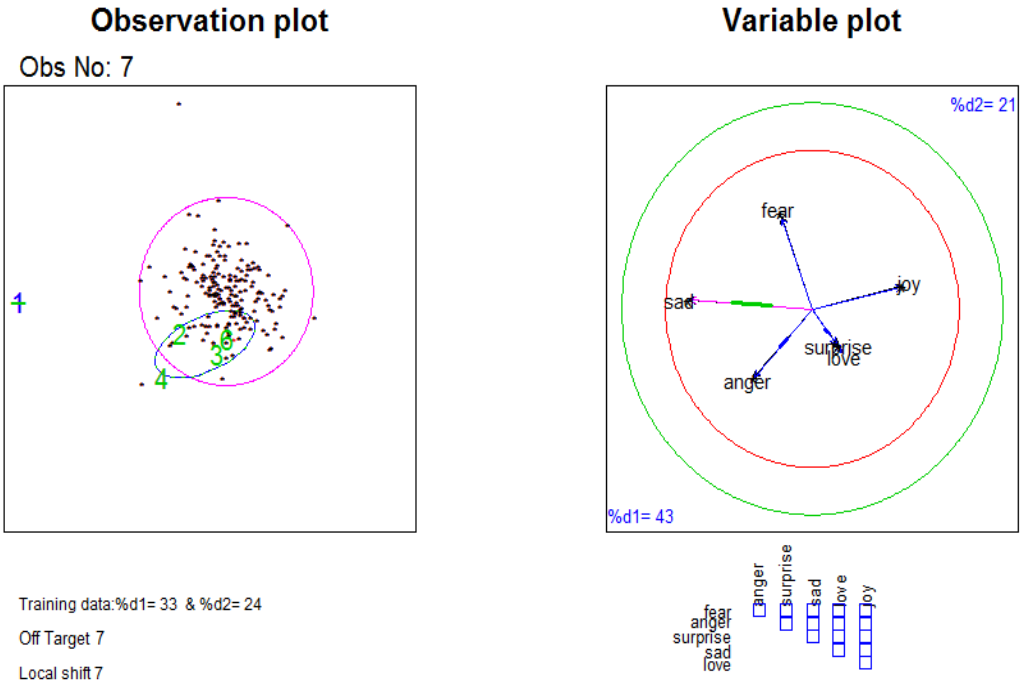

Fig. 12: Initial Response to Phillip Hughes Death

We conclude that the initial response to Phillip Hughes's death was a mixture of sadness and anger; but, later (on represented graphically), as people like Michael Clarke (the then Australian cricket captain) expressed his mateship for Phillip Hughes, this changed to the dominant response becoming love for the man who had so tragically lost his life.

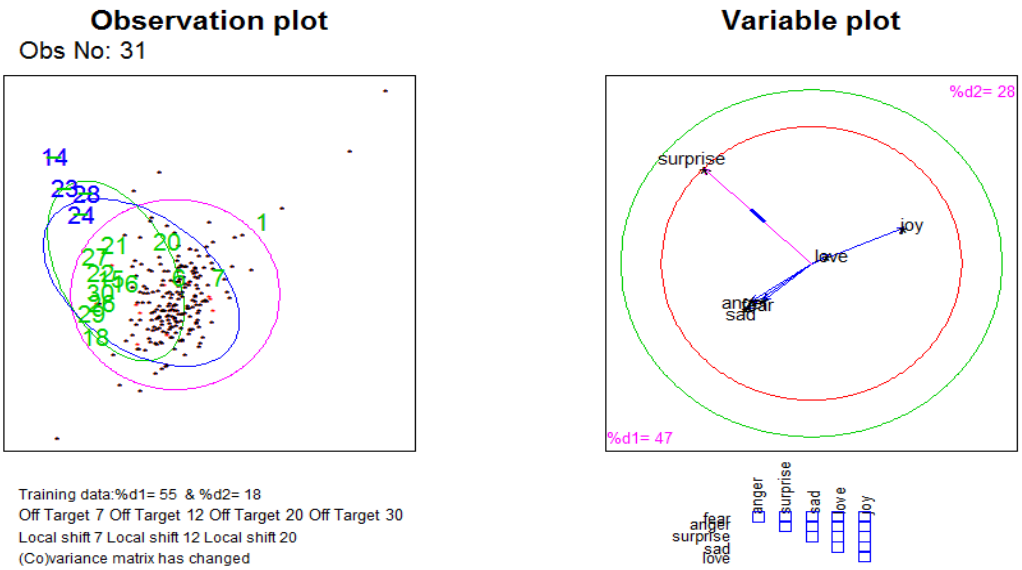

Fig. 13: Rosie Batty made Australian of the Year

Figure 14 indicates that the dominant response to Rosie Batty becoming Australian of the year was one of surprise, and all other sentiments were orthogonal to this, indicating that no other sentiment increased. This is fascinating, but it is unclear whether people were surprised about Tony Abbott (then Australian Prime Minister) making such a call, or whether they were surprised by the choice of Rosie. This choice did raise the serious issue of domestic violence within Australia, and Rosie was the perfect ambassador fighting against domestic violence seeing she had experienced it first-hand (she, and many others, witnessed her ex-husband killing their son after a cricket match). Note that there was no change in the correlation structure indicated by the matrix of boxes below the variable plot not being coloured.

In Figure 15, the dominant response to the energy debate after the South Australia energy crisis (a total blackout after a major storm) was one of increased sadness, with no other sentiment increased. The issue was one where severe weather-related events cut the supply of energy to the entire state, which has a large proportion of renewable energy. This started a national debate about the state relying too much on renewable energy sources. The interesting feature of this response was that there was no increase in angry tweets because of the state government's decision on the percentage of renewable energy to be used. I think this means that the South Australian residents don't strongly disagree with the South Australian state government energy policy. Note that there was a change in correlation structure with love and joy became less correlated. The other colours indicate warnings.

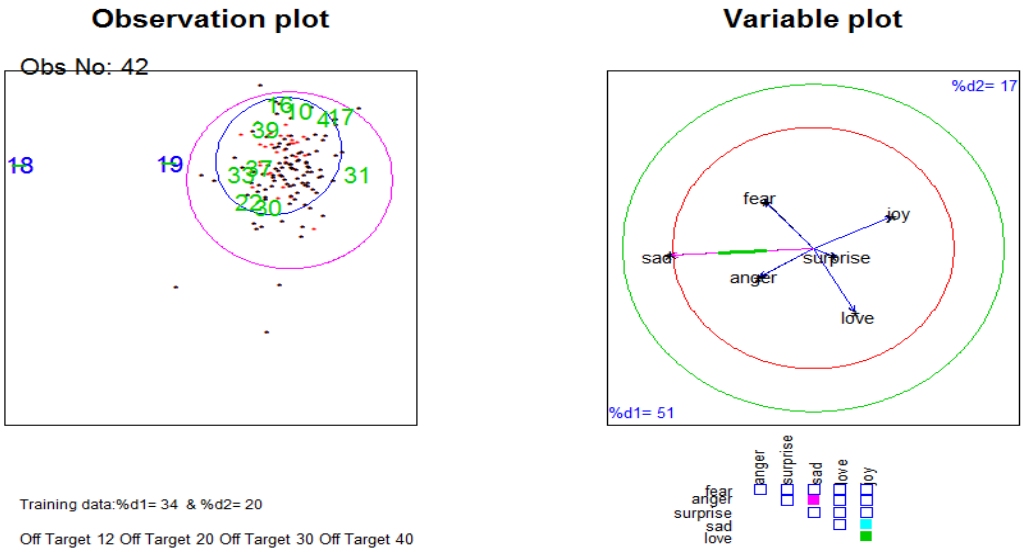

Fig. 14: Energy Debate after the South Australia Energy Crisis due to Bad Weather

In Figure 16, the dominant but weak response to the news that Australian Airforce Jets were starting to operate in Syria for the first time was initially one of anger, but this did not last long; no more than a few hours before the response was an increase in joy was dominant and remain so for more than the next 24 hours. This increase in joy was not massively significant because the mean square error for joy did not flag as significant (the joy line in the vector plot was not coloured red but the sausage shape in the middle of this vector indicate a significant increase in joyful responses). Note that there was a change in the correlation structure: love and joy became less correlated, and love and anger became more positively correlated as these counts both decreased simultaneously.

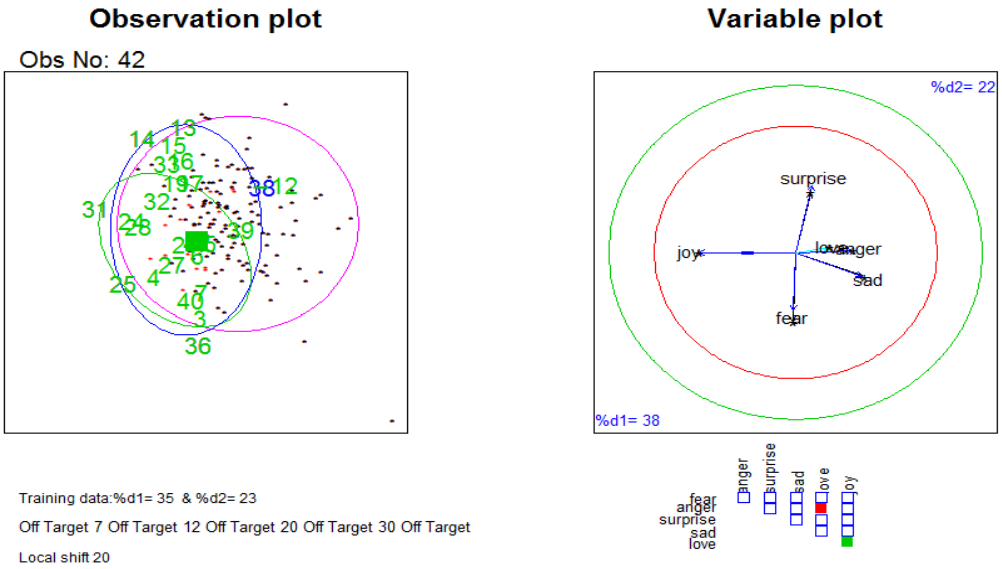

Fig. 15: Twitter response to the Australian Airforce Jet operating in Syria

The Twitter response to the arrest of Gino & Mark Stocco (Father and son) after being on the run for 8 years was a strong response of sadness, and this is mostly driven by two hours of the day at about 6 and 7pm at night when the arrest was probably reported. This does not make a whole lot of sense, but there was a non-significant reduction in the surprise, love and joy tweets which makes more sense when harden criminals are arrested. Potentially this was a case of things going wrong for two Aussie battlers.

In Figure 17, the response to phone data retention laws for internet service providers in Australia was one of increased sadness and reduced joy, but the observation plot does not flag a multivariate shift in location. Thus this response is not very strong. There is no change in correlations.

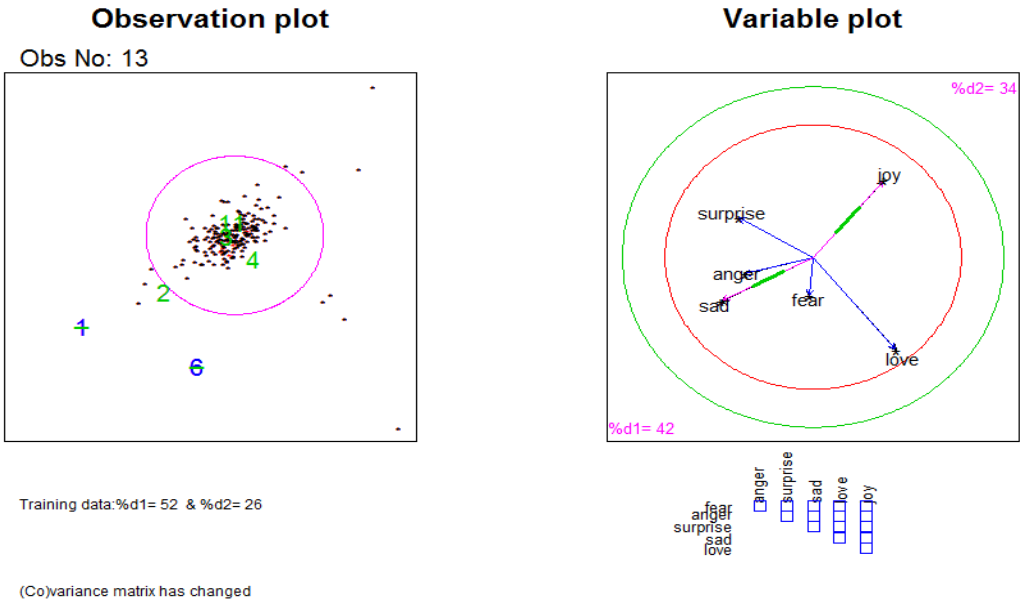

Fig. 16: The Twitters' Response to Phone Data Retention Laws

V. Conclusion

We have demonstrated ways of monitoring tweet sentiment scores for a region as a way of understanding how the region responds to events. We first defined events as those periods where the number of tweets for the region significantly increased. We then monitored how unusual the counts of these tweets were after correcting for the volume of tweets. This was achieved for each sentiment independently; however, these sentiment counts are correlated, and monitoring them independently makes interpreting the response to events quite difficult. The parallel coordinate plots are relatively easy to understand. They display trends in a reasonable way but ignore correlations. Therefore we prefer the dynamic biplot which monitors changes in location, dispersion and correlations simultaneously in one plot. It is also efficient at displaying trends in the observation plot. Although its interpretation is complex, we believe the rich information it presents makes it a reasonable tool for monitoring and understanding events.

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High-Flow Priapism following Chlorpromazine Induced Low-Flow Priapism

By Mohamed Saad Hegazy & Mustafa MR
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Abstract- Priapism is defined as a penile erection that persists more 4 hours or longer and is unrelated to sexual activity. The three main subtypes are low flow (ischemic), high flow (non-ischemic) and stuttering (intermittent or recurrent) priapism. Alpha-1 antagonistic activities of some antipsychotics, especially chlorpromazine, have been reported to be responsible for development of low-flow priapism. Chlorpromazine has the greatest alpha-adrenergic affinity among the conventional antipsychotic agents and the most frequently reported to be associated with priapism. We report a case of priapism after a first single dose of chlorpromazine (Neurazine ® 100 mg tablet, Misr Co. For Phramind-Egypt). The case was presented first by neglected low-flow priapism that had been converted to high-flow priapism due to injury of a branch of the cavernosal artery, during aspiration and irrigation treatment procedure, proved by blood gas testing of the aspirated penile blood, penile color duplex Doppler ultrasonography and selective left internal pudendal arteriogram. This conversion is an uncommon complication of such procedure.

GJMR-K Classification: *NLMC Code: NLMC Code: WK 900*

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Mohamed Saad Hegazy [α] & Mustafa MR [σ]

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I. Case Report

A 24-year-old male patient presented with priapism to our Andrology Department, Kobry El-Koba Military Armed Forces Medical Complex, Cairo-Egypt. He was fully awake, sitting calm and alert. On, Inspection, the penis was fully erected and has a dorso-ventral oscillatory movement (atrial pulse). Although the shaft was very rigid on palpation, the glans penis was semi rigid with no tenderness. Patient is not married, not known to have hypertension, sickle cell trait, history of malignancy. He denied any previous episodes of priapism, recent sexual activity or arousal, use of phosphodiesterase inhibitors or perineal trauma.

Three weeks before the patient came to us, he experienced agitation and insomnia for which he took a first single dose of chlorpromazine (Neurazine ® 100 mg tablet, Misr Co. For Phramind.-Egypt). He had observed a prolonged penile erection 5 hours after taking chlorpromazine. The patient did not give a care for his priapism for the first 18 hours. However, as his penile erection became painful and did not resolve spontaneously and after repeated ejaculation trials, he went to ER of Embaba General Hospital in next 24 hours. He was in obvious physical pain and reported that the erection had remained rigid throughout the entire 36hrs since becoming tumescent. Urologists had performed two sessions of intra-corporeal injection of 1 mg ephedrine, drainage, and irrigation with sterile saline that were not sufficient to obtain de-tumescence and they transferred the patient to Andrology Specialty Center and Department, Kasr El-Ainy Faculty of Medicine, Cairo University in the next day. Andrologists admitted the patient and diagnosed him to have a low-flow priapism by penile duplex Doppler ultrasonography with multiple intra-cavernosal fibrosis and echogenic blood clots. Corporal aspiration revealed dark, red blood with a pH of 7.24, pO2 of 20, and pCO2 of 65, consistent with low-flow, ischemic priapism. Since then, intra-corporeal injection of 1 mg ephedrine, drainage, and irrigation with sterile saline were handled at a rate of 3 cycles per session for 2 sessions over the first 24hrs and de-tumescence was achieved with some residual corporal edema. Unfortunately, the corporal bodies were again fully erect, but surprisingly not painful. Many sessions ofintra-corporeal injection of alpha-adrenergic receptor agonists with aspiration and ice-pack compression in between were done for the next consecutive 6 dayswithout improvement. They discharged the patient thereafter as the patient refused surgical intervention.

As long as erection was inevitable yet; patient came to us on day 23rd since becoming tumescent and he was admitted in our andrology in-patient unit, where basic laboratory investigations including: complete blood counts, coagulation profile, electrolytes, hepatic and renal function and sickle cell tests were done. All laboratory investigations were normal except for mild leukocytosis (TLC=14.2). Penile arterial blood gas (ABG) from the lateral base of the corporal body was obtained. The latter was consistent with high-flow priapism (bright red blood with a pH of 7.45, pO2 of 90, and pCO2 of 35). Penile duplex Doppler ultrasonography revealed bilateral echogenic, distorted cavernosa reflecting significant bilateral corporal fibrosis and the sinusoids are typically not compressible with probe pressure and engorged with sinusoidal thrombosis. Doppler assessment of the both left and right cavernosal artery, revealed significantly reduced arterial flow (<10 cm/s) giving picture of low-flow priapism except for a turbulent arteriocavernosal fistula which was determined with high-velocity and low-

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resistance flow (>90 cm/s) within the left proximal corpus cavernosus (peri-lacunar) (fig.1) giving a picture of high-flow priapism. Selective left internal pudendal arteriogram confirmed a large fistula arising from the peri-lacunar area of left corpus cavernosus (fig. 2-10).Medical interference was postponed (no embolization) according to the patient's decision.Treatment non-surgical strategy for neglected priapism was recommended in order to reduce the ongoing fibrosis process and risk of infections in the form of the following:

1. Acetylsalicylic Acid (Jusprin 81 mg tab / 24 hr, Julphar, Gulf Pharmaceutical Industries, Ras Al Khaimah, U.A.E.).
2. Pentoxifylline (Trental - SR - 400 mg tab / 8 hr, sanofi-aventis, Egypt).
3. Vitamin E (Vitamin E 1000 mg cap / 12 hr, Pharco Pharmaceuticals - Alexandria, Egypt).
4. Cefotaxime (Cefotax 1 gm vial I.V / 12 hr, Egyptian Int. Pharmaceutical Industries Co. (E.I.P.I.CO.), Egypt).

This treatment strategy is continued, except for the antibiotic (only 7 days), and priapism is not resolved yet, the rigidity is decreased by 20%, which is retained whenever sexual arousal is present and decreased back by 20% after masturbation. Follow up was handled monthly for 18 months without any other complications except for the persistent penile erection, which is still surprisingly tumescent. The case will be presented later on to report the efficacy of the new non-surgical treatment strategy we followed.

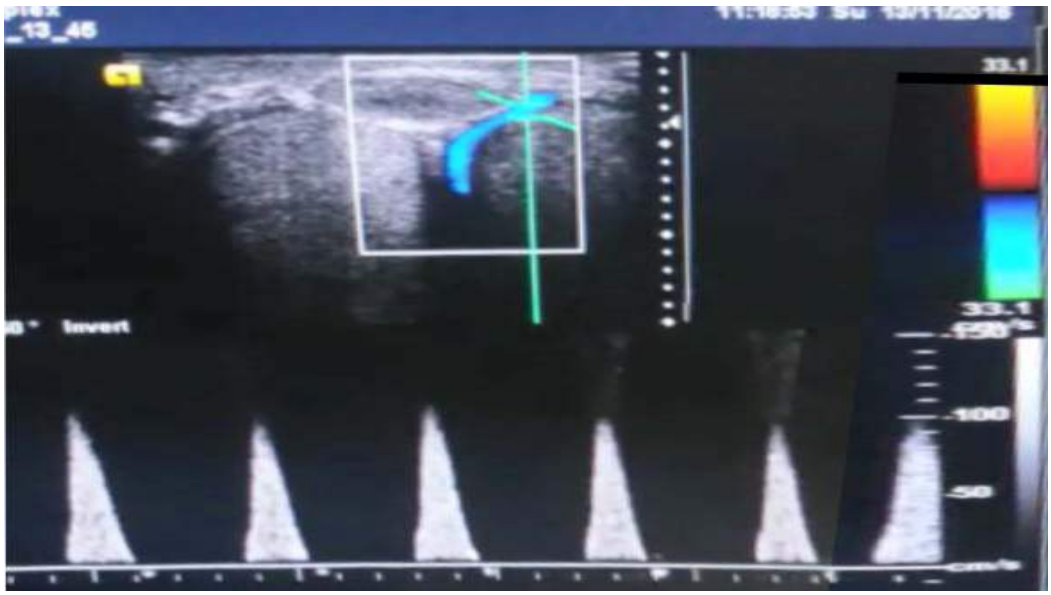

Figure 1

Figure 2

Figure 3

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Figure 9

Figure 10

II. Discussion

Priapism is defined as a penile erection that persists for 4 hours or longer and is unrelated to sexual activity that was first described in medical literature in 1845[1]. The corpus cavernosa consist of vascular spaces called sinusoids, which include smooth muscles on their walls. Arterioles in the penis that supply blood to the corpus cavernosa are in a tonic state during flaccid periods[2].The three main subtypes are low flow (ischemic), high flow (non-ischemic) and stuttering (intermittent or recurrent) priapism[3]. The identification of priapism subtype is important as delayed emergent medical interference (particularly in low flow ischemic subgroup) can result in persisting erectile dysfunction[1,3,4].

Patients with low-flow priapism will often present with rigid corpus cavernosa and pain, whereas those with high-flow priapism will often present with tumescent but not rigid corpus cavernosa and seldom report pain. The most considerable modalities to distinguish low- and high-flow priapism are blood gas testing and color Doppler ultrasonography[5]. Low flow priapism is characterized by a reduced venous outflow, hypoxia, rising PaCO2 and acidosis that can cause progressive ischemia within the cavernosal tissue with time-dependent changes in the corporal metabolic environment. This lead to smooth muscle irreversible injury and necrosis to the erectile tissue with consequent fibrosis of the corporas[3,6].

Alpha-1 antagonistic activities of some antipsychotics, especially chlorpromazine, have been thought to be responsible for development of priapism. Based on their ability to block the α-adrenergic receptors of sinusoidal smooth muscles, they lead to a reduction in resistance and uncontrolled blood flow into the corpora cavernosa[2,7,8]. Chlorpromazine has the greatest alpha-adrenergic affinity among the conventional antipsychotic agents and the most frequently reported to be associated with priapism[7,8]. It had been reported that, priapism occurred in a patient after he had taken one 25-mg tablet of chlorpromazine (the lowest dose to produce this complication). On contrary, another patient developed priapism after he had been using chlorpromazine for 3 years. In our case report, the patient developed low-flow priapism after taking his first single 100-mg tablet of chlorpromazine.This shows that priapism can occur after short-term or long-term and even after high or low dose therapy with chlorpromazine[9]. So, it is believed that low-flow priapism is not a dose-or duration-specific complication to chlorpromazine as has been reported in different studies[2,7,8,10,11].

High-flow priapism is a persistent erection caused by unregulated cavernous arterial inflow[4]. The usual cause of high-flow priapism is blunt perineal trauma. However, it may be associated with metastatic malignancy to the penis, with acute spinal cord injury and occasionally may complicate low-flow priapism after shunt procedures[4,12]. Moreover, high-flow priapism caused by iatrogenic needle trauma during pharmacological agent injections in the cavernosal body, as a treatment of early cases of low-flow priapism, is considered as an uncommon complication of such procedure. This may occur due to a lacerated cavernous artery or one of its branches leading to a high-flow fistula between the artery and the lacunar spaces of the sinusoidal tissue[13,14]. During priapism, the edematous corporal state, septal and/or intra-corporal fibrosis may anchor the cavernous arteries to a more eccentric place immediately adjacent to the inter-corporal septum. These arteries are therefore become relatively fixed and are possibly more susceptible to needle injury during corporal aspiration as happened in our case report[13].

III. Conclusion

It seems hard to predict the dose and/or duration that may cause priapism with antipsychotic medications, especially chlorpromazine, as discussed before. Among patients treated for low-flow priapism, who retain penile tumescent, a penile ABG determination and penile ultrasound are essential for early detection of converted priapism from low to high-flow priapism. Selective internal pudendal arteriogram is the golden standard technique to diagnose and treat (arterial embolization) high-flow priapism due to arterial fistulae. However, in our case, non-surgical treatment strategy is continued for about 2 years. This acquires a promising strategy as it has reduced the risk of corporal fibrosis and its complications such as irresponsive penile erection on sexual excitation.

IV. Recommendations

Clinicians should be familiar with infrequent serious adverse events of antipsychotic medications especially chlorpromazine. Performing the corporal aspiration, irrigation and injections of alpha-adrenergic receptor agonists in low-flow priapism, under the guidance of penile duplex Doppler ultrasonography to prevent injury of corporal vessels during procedure and thus preventing conversion of low-flow priapism into high-flow one.Further prospective studies on larger number of cases arerecommended in order to evaluate the effectiveness of non-surgical systemic oral medications versus the invasive surgical procedures especially in neglected cases of priapism.

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Self-Reported Knowledge and Practices of Healthcare Workers on Occupational Exposure and Protection from Infectious Disease at the Military Hospital in Sierra Leone

By Yu-Ling Qin, Henry S Bangura, Bo Li, Yue-Su Zhou, Yue Yuan, Yi Sun, Jing Li, Zhong-Peng Zhao, Jun Jiao, Bing-Song, Stephen Sevalie, Ya-Jun Song, Jia-Fu Jiang, Foday Sahr & Tian-Jun Jiang

Chinese Military Medical Experts Group in Sierra Leone

Abstract- *Objective:* To assess Healthcare workers (HCWs) knowledge and experiences with infection prevention and control (IPC) practices and towards occupational exposure in Sierra Leone, after the 2014-2015 Ebola virus disease outbreak, which in turn can be used to identify areas that require additional training.

Study Design: A cross-sectional study.

Methods: From December 9th to 23rd, 2016, questionnaires contained 45 questions spanning five themes focusing on knowledge and practice and training were administered to all clinical HCWs at the No. 34 Military Hospital, Freetown, Sierra Leone. Main outcome measures are knowledge and practices score on occupational exposure and protection from infectious disease.

Keywords: *healthcare workers: occupational exposure and protection: knowledge: practices: sierra leone.*

GJMR-K Classification: *NLMC Code: NLMC Code: WB 116, WZ 112.5.M4*

Strictly as per the compliance and regulations of:

Self-Reported Knowledge and Practices of Healthcare Workers on Occupational, Exposure and Protection from Infectious Disease at the Military Hospital in Sierra Leone

Yu-Ling Qin [α], Henry S Bangura [σ], Bo Li [ρ], Yue-Su Zhou [ω], Yue Yuan [¥], Yi Sun [§], Jing Li [χ], Zhong-Peng Zhao [ν], Jun Jiao [θ], Bing-Song [ζ], Stephen Sevalie [£], Ya-Jun Song [€], Jia-Fu Jiang [₣], Foday Sahr [₴], Tian-Jun Jiang [₲]
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Results: A total of 190 (86.3%) of 220 questionnaires were completed and returned. More than half of HCWs (52.6%) reported having been injured by medical sharps during an operation or associated work. Knowledge, practice and the degree of training level was significant by occupation or department (P=0.029 and P=0.039, respectively). Multivariate logistic regression analysis showed that the Under Fives Clinic (P = 0.013, OR = 9.874) was a risk factor for sharps injury, while receiving specialized training (P = 0.015, OR = 0.422) was protective.

Conclusions: The HCWs at the hospital had insufficient knowledge and practices on occupational exposures and protective measures. The need for more intensive training and the establishment of the evaluation systems for occupational exposures are required for the study hospital.

Keywords: healthcare workers: occupational exposure and protection: knowledge: practices: sierra leone.

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I. Introduction

The protection of medical personnel from exposures to infectious agents is crucial to ensure occupational health and safety, while reducing the risk of hospital-acquired infections. Proper training and safe practices help reduce the spread of disease, especially in outbreak scenarios. West Africa serves as a natural focus for multiple highly infectious agents, many of which are considered blood-borne pathogens and pose a serious risk for occupational exposure in HCWs. It is particularly important in developing countries, like Sierra Leone, which lacks resources and infrastructure, and has limited access to infection prevention and control (IPC) training. Although attempts have been made to characterize gaps in training in these settings, research focusing on knowledge and practices of HCWs towards adhering to basic precautions has been largely ignored.

The Ebola virus disease (EVD) outbreak from 2014-2016, which infected 28,616 and resulted in over 10,000 deaths in West Africa serves as a grim reminder of the importance of protecting the health and safety of HCWs [1]. The cumulative incidence rate of Ebola was almost 100 times higher in HCWs than in the general population [2]. A total of 199 laboratory-confirmed Ebola cases reported from Sierra Leone were in HCWs [3], of which, 101 out of 127 (79.6%) died [4]. With the help of the international community, the epidemic was effectively contained in 2016 in part due to increased training in IPC [5].

Ebola infection prevention and control in primary healthcare facilities located in Sierra Leone, gradually improved during the outbreak as preventative practices were followed [6]. However, the dilemma facing Sierra Leone and other Ebola-affected countries is how to maintain proper IPC. Unfortunately, data on HCW occupational exposures and acquired infections in West Africa including Sierra Leone remains scarce. Survey data from 19 hospitals in Ethiopia, showed that the level of awareness of general preventive measures

was lower in the HCWs, with reported sharps injuries at 29.1% a year [7]. Now that Ebola has been controlled for over two years, HCWs knowledge, self-efficacy and experiences with IPC practice in this country required further investigation.

In order to better understand gaps in knowledge and practice regarding occupational safety and exposure, we surveyed HCWs, post-Ebola epidemic, at the No. 34 Military Hospital, the only general hospital in the army, where these same staff admitted and treated a large volume of EVD patients months earlier. Our objectives were to assess HCWs knowledge, and experiences with IPC practice, which in turn can be used to identify areas that require additional training. It is hoped that the findings and recommendations in this article will influence hospital authorities and elicit lasting change in how these outcomes are measured and what is needed to reduce the risk of infection in HCWs in Sierra Leone.

II. Methods

a) Study Design and Population

A descriptive cross-sectional study was conducted at the 34 Military Hospital, which has 200 beds for the admission of various medical conditions and is located at the Wilberforce Barracks, Freetown, Sierra Leone. This hospital provides both the secondary and tertiary health care for soldiers, their families and civilian workers in the Ministry of Defence. A few in hospital educational opportunities (such as lecture for occupational health) were held periodically in the hospital as a reason for extremely humble and broken lecture room etc. All health care workers at the Hospital must have completed the secondary school level of education before enrolling in any category of health related courses. Some state Enrolled Community Health Nurses (SECHNs) have completed the three years course in community health nursing from the recognized nursing schools in Sierra Leone. Some are Health Care Assistants (HCA) who serve as assistants to the SECHNs. All 220 HCWs involved in clinical diagnosis and treatment of patients were invited to participate in this study (Table 1). All responses to the questionnaire were confidential and de-identified. Recruitment took place from December 9 to 23, 2016. Ethical approval was obtained from the study hospital.

b) Design and Administration of the Questionnaire

Data were collected using a self-filled in, structured questionnaire, which was developed after reviewing related references [8-11]. The survey had questions on socio-demographic characteristics, and 45 questions across five themes, including actual practice of preventive measures (Q5-Q8, Q10-Q11,Q17-Q19 and Q29-31, Appendix), knowledge and perception of universal precautions and infectious disease (Q32-Q45), training level (Q20-Q26, Q28), and some probable reasons for poor practice (Q9, Q12-Q15), as well as self-evaluation and external evaluation (Q1-Q4, Q16, Q27) (Appendix). Ten questions had binary (yes or no) responses, seventeen multi-items questions had one correct answer, and eighteen multiple choice questions focusing on practice and knowledge of infectious diseases which had more than one correct answers. Each study participant was required to fill out information mentioned above. For some volunteered nurses or low education level nurses who cannot really understand the meaning of some question and choices, the investigators from the hospital explained them. Three co-investigators from Chinese Military Medical Experts Group in Sierra Leone supervised data collection.

The questions which had only one correct answer were graded in the categories of wrong and right. Eighteen multiple choice questions which had more than one correct answers were graded in the categories of completely wrong (very poor), poor, intermediate or adequate according to the combination of the response answer. These levels were given scores of zero, one, two and three for completely wrong (very poor), poor, intermediate or adequate (right), respectively. Total scores for knowledge, practice, and training were calculated and split into three cut-points based on quartiles of ranked data values. Education levels were stratified as follows: Bachelor's degree and above as 'High', diploma certificate as 'Middle', and technical, SECHNs, HCA, secondary school, and midwife all categorized as 'Tertiary' background.

c) Data Analysis

Univariate analysis was used to access the association between socio-demographic characteristics and knowledge, practice, and training level, by using a chi-square test or a Fisher's exact test. All variables with a P-value of <0.05 from univariate analysis were entered into a multivariate forward stepwise logistic regression analysis. All analyses were conducted using SPSS (version 18.0, SPSS Inc. Chicago, IL).

III. Results

a) Participant Characteristics

There were 190 respondents with valid questionnaires, giving a response rate of 86.3% (190/220). Demographic data can be found in Table 1. More than half of HCWs were categorized as 'tertiary' for educational level and according to the self-evaluation, 77.9% of participants rate their level of occupational protection knowledge and protection awareness as high.

b) Survey Response Results

According to responses, 17.4% of the staff knew how to deal with needles and syringes correctly, and 12.1% of staff knew how to respond to sharp

injuries correctly. Less than 10 % of staff knew exactly what scenarios required follow-up hand washing or disinfection, and 15.8% knew in what cases they should wear gloves. When responding to questions about the routes of transmission for HIV and Hepatitis B Virus, 26.3% and 27.9% of participants answered correctly, respectively. Less than half of staff (42.6%) answered correctly about proper protection from blood-borne exposures from HIV patients. The results also showed that 27.9% of the HCWs never received professional protection training. Furthermore, 98.4% think it is necessary to set up occupational protection courses regularly and more than half (64.7 %) reported that the hospital is insufficiently supplied with protective equipment (Table S1 Appendix).

A majority of self-reported sharp injuries occurred when recapping (56.8%), breaking the ampoule (52.1%), and removing the needle from the syringe or infusion set (31.1%). A total of 101 (53.2%) HCWs responded that the reason why people operate without gloves is that gloves are not available or there is a shortage. Less than half of HCWs (48.9%) have never been injured by medical sharps during operation before. Of those who did report a previous sharps injury, 23-76% was due to carelessness, in a hurry, inadequate lighting in the work place or not following the standardized sharps protocol. Among staff who were suffered from the sharp injury, the breakdown by department is as follows, 84.6% in the Under Fives Clinic, 80% in the Laboratory, 70% in Physiotherapy, 56.7% in Internal Medicine and 40.6% in the Surgical Department. Encouragingly, 86.3% participants responded that they would report to superior immediately if they get a sharp injury.

c) *Knowledge & Practice & Training and Associated Factors*

Sixty (31.6%) and thirty-four (17.9%) of HCWs had intermediate and adequate knowledge on occupational exposure and protection from infectious disease respectively, while eighty-two (43.2%) and twelve (6.3%) had an intermediate and good practice on them respectively (Table 2). Findings also revealed that work experience years, type of occupation, type of department were associated significantly with knowledge on occupational exposure and protection. In addition, occupation, type of department and gender were also associated significantly with practice level. In addition, the level of received training among occupation or department was significantly different respectively (Table 2). A majority of volunteer nurses scored below poor in training (90.9%). The training level of staff from the surgical department and the Under Fives Clinic were also below other staff, with 61.8% and 66.7% at the very poor level, respectively.

Analysis of practices showed significant differences between younger and older staff compared to middle age staff members for the following: when hand washing and disinfection of hands should occur (Q31), when should you report to your superior if you get a sharp injury (Q43) and what should a nurse wear when receiving a new patient with Fever of Unknown Origin (Q35). The participants with different education levels had significantly different responses based on the following questions: disinfecting nursing equipment (Q29), dealing with contaminated medical equipment (Q30), frequency of cleaning and disinfecting the surface of trolleys or desks (Q31) as well as when should you wash your hands (Q32) (Table 3, $P<0.05$). The military nurses and technicians had significantly more correct responses than those from other groups. It also showed that there are a higher proportion of participants from the laboratory who had correct practices (Q11, Q43). However, the participants from the Surgical Department and the Under Fives Clinic had more poor or incorrect responses (Q11, Q17, Q29, Q33, Q36-Q45). Among the 97 (51.1%) HCWs who reported having been injured by medical sharps during medical-associated work, multivariate logistic regression analysis showed that the Under Fives Clinic ($P = 0.013$, $OR = 9.874$) was a risk factor for sharps injury, while receiving specialized training ($p = 0.015$, $OR = 0.422$) was protective.

IV. Discussion

The present study assessed knowledge and practices of healthcare workers (HCWs) on risks of occupational exposure and proper protection from infectious diseases at the military hospital located in Sierra Leone after the Ebola outbreak. To our knowledge, this is the first study to quantitatively / qualitatively describe the knowledge and practices of HCWs towards infectious disease prevention and control in Sierra Leone post-Ebola outbreak.

We found that 49.5% of the participants had an intermediate or adequate knowledge on occupational exposures and protection from infectious diseases, and good practice, while 42.6% staff had a positive response for protection from blood-borne exposure of HIV patients. This low insufficient knowledge and perception are at a similar level to that which was reported in Ethiopia [7] and Iran [12]. Only 26.3% and 27.9% of staff understood the route of transmission for HIV and Hepatitis B Virus, respectively. It is also similar to same settings in South Africa [13] and lower than that (two third) at some regional hospitals in Tanzania [14], as well as the developed countries [15, 16]. In addition, the present study also showed that the proportion that received training among participants were very low according to self-assessment and objective assessment, with variations observed by occupation and department (Table 2). According to a retrospective descriptive study of Ebola virus disease transmission among health care workers in Sierra Leone from May to December 2014, 34

% (85) reported that they had not been trained in infection prevention and control [2]. Our results showed that 27.9% of the HCWs in this hospital never received professional protection training. In addition, the training level of staff from the Surgical Department and Under Fives Clinic was deemed insufficient and most of the volunteer nurses received inadequate training. Receiving special training, such as post exposure prophylaxis and infection prevention and control [14], as well as stressing the importance and proper practice of hand hygiene along with improving hand sanitizer options in disinfection protocols can improve occupational protection from infectious disease [17].

Needle-stick and sharps injuries carry the risk of infection and are occupational hazards for all health care professionals involved in clinical care. Our present study showed that more than half of HCWs (51.1 %) had been injured by medical sharps during work, which indicates that the overall occupational exposure among the subjects was alarmingly higher than the 29.1% needle stick injury prevalence reported in Ethiopia[7] and 27.5% in India [18]. Additionally, 17.4% of the staff knew how to dispose of used needles and syringes, suggesting that more than 80% of the staff were inadequately trained in handling needles and syringes correctly. According to survey responses, 12.1% of staff can deal with sharp injury correctly, indicating a potential risk of no socomial infections. However, though occupational sharps injuries are common among HCWs in this study area, 86.3% participants responded that they will report to superior immediately if a sharp injury occurs, which scores higher than the 42.3% who would report a sharp injury to a superior in Ethiopia [19] and 37% of respondents reporting needle sticks in Nigeria [20].

Our results found that more sharp injuries happened when recapping (56.8%), breaking the ampoule (52.1%), removing the needle from the syringe or infusion set (31.1%). This is comparable to a multi-center research study in Lagos, Nigeria, which found that the most common activity leading to needle-stick and sharps injuries was recapping of needles (45%) [20]. In addition, among the HCWs injured by medical sharps, 41-76% was due to carelessness, hurry, or not following standard protocols. However, it should be noted that 23.7% was due to inadequate lighting in the work place. Thus, administrative and hospital policies, should also be strengthened to reduce the risk of occupational exposures in HCWs. The present study showed that 84.6% staffs in the Under Fives Clinic, which provides services for children under- five years and pregnant women, were suffered from the sharp injury. The reason and the risk factors maybe are that there is more outpatient volume as more free treatment, more frequency for re-capping of needles after injection procedures, or A more humble and crowded environment in this hospital.

Proper hand hygiene is one of the most simple and effective measures to prevent occupational exposure and reduce hospital infections in HCWs. This present study showed middle compliance (82.6%) to standard six-step hand wash procedure, with more problems on hand washing among doctors and lab technicians. While 66.8% had correct knowledge and practice of drying hands after washing, less than 10 % of staff knew exactly what occasions they should wash or disinfect hands, especially for younger and older staff members. We did not investigate the reasons for non-compliance to hand washing and drying. Good practice of basic hygiene need not only proper training, but also available amenities like portable water, hand washing stations and other enhanced infrastructure [21, 22]. As there has the high prevalence of cholera, typhoid fever, tuberculosis, pneumonia, influenza it is important and necessary that hand hygiene is stressed heavily in healthcare settings, as it is the most simple and effective measures to prevent and reduce hospital acquired infections.

It was not surprising that the degree of training was associated with level knowledge ($\chi 2=52.04$, $P<0.01$). However, this was not the case with practice level ($\chi 2=11.86$, $P=0.221$), which suggest that good practice should be stressed more in field operations, clinical settings, and under direct supervision, while ensuring that facilities are well equipped to maintain HCW safety.

a) Limitations

This study is based solely on self-reported results, which can allow for potential recall bias. Furthermore, less than half of clinical doctors (8 out of 19) responded to the questionnaires, limiting our ability to infer findings among this population and potentially exposing this study to non-response bias. In addition, because of the lack of data for HCW's knowledge before the outbreak of EVD in 2014-2015, the impact of the outbreak of EVD on the knowledge level of HCWs was not assessed. Finally, this study only occurred in one Hospital, which may not be representative of other healthcare settings in Sierra Leone.

V. Conclusions

Relatively scarce knowledge and practicing of hand hygiene, high frequency of sharp injuries, lack of understanding of important infectious diseases, and the insufficient facilities and supplies will continue to place HCWs at risk of hospital-acquired infections in Sierra Leone. We recommend that more intensive and targeted training be carried out as soon as possible, focusing on the above mentioned. Additionally, this hospital should strengthen supervision, particularly of volunteer nurses, while providing adequate supplies critical to reducing disease exposure risks, such as gloves, sharp boxes, and gowns. There is an urgent to establish the infection

control evaluation systems for occupational exposures, including necessary designated infection control / occupational health professionals, regular infection control committee meetings to resolve issues, and provision of necessary supplies for the study hospital in Sierra Leone.

VI. Author Statements

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Ethics and Consent to Participate: Before commencing the study advice was sought from the ethics committee of No.34 Military Hospital, Wilberforce, Freetown. Because the survey was anonymous, only involved contact and interview with health care worker, and was essentially an audit of current occupational health arrangements, ethical approval was unnecessary. The written informed consent was obtained from participants as they chose to respond to the survey questionnaire.

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Table 1: Demographic Characteristics of Healthcare Workers who had Validity Response to Questions and all Participants

Groups	Parameters	Validity Response No. (%) (n=190)	Required Participants No. (%) (n=220)
Sex	Male	114 (60.0)	129 (58.6)
	Female	76 (40.0)	91 (41.4)
Age	21 - 25	15 (7.9)	18 (8.1)
	26 - 45	129 (67.9)	151 (68.6)
	> 45	46 (24.2)	51 (23.3)
Work Years	1 - 5	64 (33.7)	75 (34.0)
	6 - 20	104 (54.7)	121 (55.0)
	> 20	22 (11.6)	24 (11)
Education	High	5 (2.6)	6 (2.7)
	Middle	81 (42.6)	94 (42.7)
	Tertiary	104 (54.7)	120 (54.6)
Occupation	Military Nurse	108 (56.8)	120 (54.5)
	Civil Nurse	48 (25.3)	54 (24.5)
	Volunteer Nurse	12 (6.3)	14 (6.4)
	Technical	13 (6.9)	13 (5.9)
	Medical Doctor	8 (4.1)	19 (8.6)
Department	Surgical Depart Department	34 (17.9)	41 (18.6)
	Internal Medicine	31 (16.3)	37(16.8)
	Emergency Depart	25 (13.2)	30 (13.6)
	Pediatrics Depart	21 (11.1)	24 (10.9)
	Laboratory	15 (7.9)	18 (8.1)
	Under Fives Clinic	13 (6.8)	15 (6.8)
	Physiotherapy	11 (5.8)	13 (5.9)
	Medical Inspection Room	7 (3.7)	9 (4.1)
	Gynecology	6 (3.2)	8 (3.6)
	Mortuary Dept.	5 (2.6)	6 (2.7)
	Others*	22 (11.7)	19 (8.6)

* : From Ebola Survivors Clinic, Dental Department, X-Ray Department, Chest Clinic, Ophthalmology Department, Operation Theatre, Infectious Disease Control Unit, where the number of participator are under four respectively.

Table 2: Knowledge, Practice and Training of Respondents on Occupational Exposure and Protection

Response % (n=190)

	Knowledge Level Grade Score					Practice Level Grade Level					Training Level Grade Level					
	Very Poor	Poor	Interm-ediate	Good	*P* Value	Very Poor	Poor	Inter-mediate	Good	*P* Value	Very Poor	Poor	Interm-ediate	Adeq-uate	Total	*P* Value
	≤18	19-22	23-27	28+		≤29	30-31	32-34	≥ 35		≤ 11	12-13	14-17	≥18		
	Age (Years)				0.244					0.986						0.247
>45	23.9	21.7	37.0	17.4		28.3	19.6	47.8	4.3		29.5	11.4	36.4	22.7	100	
21-25	53.3	26.7	13.3	6.7		26.7	20.0	46.7	6.7		33.3	26.7	33.3	6.7	100	
26-45	24.0	24.8	31.8	19.4		31.8	20.2	41.1	7.0		42.1	11.9	23.0	23.0	100	
	Sex				0.287					0.012						0.012
Male	21.9	25.4	35.1	17.5		23.7	17.5	51.8	7.0		33.6	9.1	33.6	23.6	100	
Female	33.3	22.7	25.3	18.7		41.3	24.0	29.3	5.3		45.9	18.9	16.2	18.9	100	
	Work Experience (Years)				0.032					0.295						0.108
>20	18.2	31.8	36.4	13.6		13.6	31.8	45.5	9.1		28.6	9.5	42.9	19.0	100	
1-5	42.2	15.6	26.6	15.6		29.7	25.0	39.1	6.3		47.6	17.5	22.2	12.7	100	
6-20	18.3	27.9	33.7	20.2		34.6	14.4	45.2	5.8		34.7	10.9	26.7	27.7	100	
	Education Background				0.154					0.616						0.225
High	24.0	26.0	34.6	15.4		29.8	18.3	47.1	4.8		31.4	16.7	30.4	21.6	100	
Middle	28.4	23.5	29.6	18.5		29.6	22.2	39.5	8.6		45.6	8.9	24.1	21.5	100	
Tertiary	40.0	0.0	0.0	60.0		60.0	20.0	20.0	0.0		75.0	0.0	0.0	25.0	100	
	Occupation				0.010					0.043						0.029
Civil Nurse	20.8	25.0	35.4	18.8		35.4	20.8	37.5	6.3		47.9	14.6	20.8	16.7	100	
Medical Doctor	37.5	25.0	00.0	37.5		50.0	25.0	12.5	12.5		71.4	0.0	0.0	28.6	100	
Military Nurse	22.2	25.0	36.1	16.7		26.9	16.7	51.9	4.6		32.7	11.5	31.7	24.0	100	
Technical	26.7	20.0	26.7	26.7		33.3	13.3	33.3	20.0		20.0	6.7	46.7	26.7	100	
Volunteer Nurse	81.8	18.2	0.0	0.0		27.3	54.5	18.2	0.0		54.5	36.4	0.0	9.1	100	
	Department				0.012					0.006						0.039
Emergency Depart	12.0	16.0	52.0	20.0		24.0	16.0	60.0	0.0		40.0	8.0	20.0	32.0	100	
Gynecology	50.0	0.0	50.0	0.0		50.0	33.3	16.7	0.0		33.3	16.7	33.3	16.7	100	
Medical Inspection	0.0	14.3	57.1	28.6		0.0	14.3	57.1	28.6		16.7	0.0	33.3	50.0	100	
Internal Medicine	19.4	51.6	25.8	3.2		29.0	12.9	45.2	12.9		40.0	13.3	43.3	3.3	100	
Laboratory	20.0	20.0	33.3	26.7		33.3	13.3	33.3	20.0		20.0	13.3	33.3	33.3	100	
Mortuary	20.0	20.0	60.0	00.0		0.0	60.0	40.0	0.0		0.0	20.0	20.0	60.0	100	
Pediatrics Depart	23.8	23.8	33.3	19.0		42.9	19.0	38.1	0.0		28.6	14.3	19.0	38.1	100	
Physiotherapy	27.3	18.2	36.4	18.2		45.5	0.0	45.5	9.1		36.4	18.2	18.2	27.3	100	
Surgical Department	38.2	14.7	20.6	26.5		23.5	29.4	44.1	2.9		61.8	5.9	23.5	8.8	100	
Under Fives Clinic	61.5	7.7	7.7	23.1		69.2	30.8	0.0	0.0		66.7	16.7	8.3	8.3	100	
Others	22.7	36.4	22.7	18.2		18.2	18.2	59.1	4.5		20.0	25.0	35.0	20.0	100	
Total	**26.3**	**24.2**	**31.6**	**17.9**		**30.5**	**20.0**	**43.2**	**6.3**		**38.4**	**13.0**	**27.0**	**21.6**	**100**	

Notes: The open-ended questions for knowledge, practice, and training regarding infectious diseases were graded in the categories of very poor (completely wrong), poor, intermediate or adequate and then were given scores of zero, one, two and three respectively. Total scores for knowledge, practice, and training for each HCWs participants were calculated respectively, and then split into three cut-points level based on quartiles of ranked data values.

Table 3: Relationship between Risk Factors and Selected Main Question on Occupational Exposure and Protection With Significant Differences

Number of Response

		Age (Years)				Work Experience				Education Level				Occupation*						Department**											
		21-25	26-45	>45	P	1-5	6-20	>20	P	Tertiary	Middle	High	P	Mil- Nur	Civ- Nur	Med Doc	Tec	VolNur	P	Eme	Gyn	MIR	Int	Lab	Mor	Oth	Pae	Phys	Surg	UndFive	Total	P
How do you deal with needles and syringes after using? (Q11)	Wrong	0	18	16	0.138	6	16	2	0.248	17	6	1	0.464	13	5	1	3	2	0.012	3	1	1	1	2	2	3	5	2	2	2	24	0.000
	Poor	9	88	34		41	74	16		69	59	3		80	37	5	5	4		21	4	3	20	4	2	17	16	4	30	10	131	
	Correct	6	23	6		17	14	4		18	16	1		15	6	2	7	5		1	1	3	10	9	1	2	0	5	2	1	35	
Do you protect yourself from patients' blood and body fluids as potential sources of infection? (Q17)	Wrong	0	3	0	0.352	3	0	0	0.002	1	2	0	0.465	2	1	0	0	0	0.876	0	0	0	0	0	0	0	0	0	3	0	3	0.087
	Yes	14	121	44		56	103	20		97	77	5		101	46	8	14	10		24	5	7	27	14	5	22	21	11	30	13	179	
	No	0	1	2		1	0	2		1	2	0		2	0	0	1	0		1	0	0	0	1	0	0	0	0	1	0	3	
	Unknown	1	4	0		4	1	0		5	0	0		3	1	0	0	1		0	1	0	4	0	0	0	0	0	0	0	5	
How do you deal with contaminated items from the patients? (Q18)	Correct	14	119	40	0.766	57	97	19	0.258	95	74	4	0.454	98	44	7	14	10	0.996	24	4	7	30	14	0	22	20	11	29	12	173	0.000
	Wrong	1	10	6		7	7	3		9	7	1		10	4	1	1	1		1	2	0	1	1	5	0	1	0	5	1	17	
How often do you disinfect the nursing equipment (eg. blood pressure monitors, temperature gun) (Q29)	Poor	3	21	7	0.855	12	16	3	0.806	19	12	0	0.001	18	5	2	3	3	0.028	5	3	0	3	3	0	1	3	5	4	4	31	0.091
	Intermediate	10	87	34		45	70	16		74	55	2		75	34	3	11	8		17	3	7	21	10	5	18	16	4	25	5	131	
	Adequate	1	10	1		4	8	0		5	7	0		4	7	0	1	0		1	0	0	4	1	0	2	2	0	2	0	12	
	Wrong	1	11	4		3	10	3		6	7	3		11	2	3	0	0		2	0	0	3	1	0	1	0	2	3	4	16	
If medical items are contaminated by the patient's blood, body fluids, how to do? (Q30	Wrong	1	7	1	0.322	3	6	0	0.547	7	1	1	0.010	5	3	1	0	0	0.014	2	0	0	0	0	0	0	3	0	1	3	9	0.044
	Intermediate	1	18	2		9	11	1		7	12	2		8	3	3	3	4		2	1	0	6	4	1	1	0	2	2	2	21	
	Adequate	13	104	43		52	87	21		90	68	2		95	42	4	12	7		21	5	7	25	11	4	21	18	9	31	8	160	
How often do you clean and disinfect the surface of trolleys or desks (Q31)	Wrong	2	10	7	0.332	7	11	1	0.554	11	7	1	0.016	9	8	1	1	0	0.074	1	0	0	5	1	0	1	3	2	4	2	19	0.681
	Correct	13	111	37		56	86	19		88	71	2		92	39	5	14	11		24	6	7	25	14	4	21	16	7	27	10	161	
	Unclear	0	8	2		1	7	2		5	3	2		7	1	2	0	0		0	0	0	1	0	1	0	2	2	3	1	10	
When should you wash your hands? (Q32)	Poor	9	53	18	0.581	31	40	9	0.311	43	35	2	0.001	45	19	4	5	7	0.048	8	2	0	26	4	1	9	5	2	15	8	80	0.000
	Intermediate	5	63	25		31	52	10		54	39	0		52	26	1	10	4		12	4	6	4	11	4	10	15	8	16	3	93	
	Adequate	1	13	3		2	12	3		7	7	3		11	3	3	0	0		5	0	1	1	0	0	3	1	1	3	2	17	
When should you wash hand and then disinfect your hands? (Q33)	Wrong	4	15	11	0.037	10	14	6	0.621	17	13	0	0.189	19	5	0	3	3	0.700	1	2	0	8	2	1	4	1	3	5	3	30	0.388
	Poor	8	105	29		48	80	14		81	56	5		78	38	8	11	7		19	4	7	22	11	4	15	19	6	25	10	142	
	Adequate	3	9	6		6	10	2		6	12	0		11	5	0	1	1		5	0	0	1	2	0	3	1	2	4	0	18	

What should a nurse wear when receiving a new patient with Fever of Unknown Origin? (Q35)	Wrong	8	52	19	0.045	33	39	7	0.111	44	34	1	0.164	45	21	2	3	8	0.043	11	5	1	7	2	1	14	9	5	16	8	79	0.008
	Poor	1	3	0		3	1	0		1	2	1		1	0	1	1	1		0	0	0	1	2	0	0	0	0	1	0	4	
	Intermediate	6	25	14		9	28	8		26	18	1		28	9	1	6	1		8	0	4	5	6	3	6	5	3	4	1	45	
	Adequate	0	49	13		19	36	7		33	27	2		34	18	4	5	1		6	1	2	18	5	1	2	7	3	13	4	62	
Standard precautions for medical personnel protection includes: (Q36)	Poor	9	45	12	0.102	30	30	6	0.088	35	30	1	0.136	34	18	2	4	8	0.011	6	3	1	21	3	0	6	3	1	14	8	66	0.003
	Intermediate	3	43	22		19	38	11		38	30	0		45	17	0	4	2		11	2	2	8	5	2	7	9	7	12	3	68	
	Adequate	3	41	12		15	36	5		31	21	4		29	13	6	7	1		8	1	4	2	7	3	9	9	3	8	2	56	
What are the routes of transmission of HIV? (Q38)	Wrong	0	5	2	0.438	3	1	3	0.009	1	6	0	0.162	3	0	0	2	2	0.002	0	1	1	2	2	0	0	0	0	0	1	7	0.006
	Poor	5	24	6		17	15	3		19	14	2		18	7	3	2	5		4	1	0	2	2	0	4	3	3	10	6	35	
	Intermediate	9	67	24		35	56	9		60	39	1		56	34	2	5	3		11	3	4	25	3	4	13	12	7	16	2	100	
	Adequate	1	33	14		9	32	7		24	22	2		31	7	3	6	1		10	1	2	2	8	1	5	6	1	8	4	48	
What are the routes of transmission of Hepatitis B Virus? (Q39)	Wrong	0	10	1	0.089	3	7	1	0.006	7	4	0	0.481	7	1	0	3	0	0.063	4	0	0	0	3	0	1	2	0	1	0	11	0.000
	Poor	9	41	10		31	26	3		28	31	1		28	17	3	4	8		11	3	0	2	4	0	4	4	5	19	8	60	
	Intermediate	3	44	18		13	44	8		40	22	3		40	19	2	3	1		2	0	4	25	1	3	9	12	1	7	1	65	
	Adequate	3	34	17		17	27	10		29	24	1		33	11	3	5	2		8	3	3	4	7	2	8	3	5	7	4	54	
How long is the best period to take prophylaxis for HIV after exposed to contaminated items of HIV patient? (Q40)	Wrong	10	70	26	0.653	38	57	11	0.714	58	45	3	0.981	58	23	5	11	9	0.169	9	2	3	7	14	5	13	19	7	16	11	106	0.000
	Adequate	5	59	20		26	47	11		46	36	2		50	25	3	4	2		16	4	4	24	1	0	9	2	4	18	2	84	
What should you do if blood from HIV patients splashed into your eyes (Q41)	Wrong	8	77	24	0.640	37	58	14	0.792	58	48	3	0.886	62	30	5	6	6	0.647	9	4	4	25	6	3	13	9	7	26	3	109	0.003
	Adequate	7	52	22		27	46	8		46	33	2		46	18	3	9	5		16	2	3	6	9	2	9	12	4	8	10	81	
When should you report to your superior if you get a sharp injury? (Q43)	Wrong	2	23	1	0.030	8	16	2	0.696	13	12	1	0.827	10	9	3	0	4	0.008	1	3	0	4	0	0	2	8	3	2	3	26	0.002
	Adequate	13	106	45		56	88	20		91	69	4		98	39	5	15	7		24	3	7	27	15	5	20	13	8	32	10	164	
What do you need to wear when receiving EVD (Ebola virus disease) patients? (Q44)	Poor	5	18	9	0.404	16	13	3	0.208	15	16	1	0.267	15	6	2	3	6	0.006	5	1	0	3	3	0	2	2	2	7	7	32	0.000
	Intermediate	5	54	17		25	44	7		49	26	1		42	20	1	10	3		6	1	3	23	9	0	9	11	4	7	3	76	
	Adequate	5	57	20		23	47	12		40	39	3		51	22	5	2	2		14	4	4	5	3	5	11	8	5	20	3	82	
When should you dispose the sharp box? (Q45)	Wrong	13	81	31	0.176	41	68	16	0.755	70	52	3	0.873	68	31	6	9	11	0.155	19	6	3	25	9	5	14	6	5	23	10	125	0.002
	Adequate	2	48	15		23	36	6		34	29	2		40	17	2	6	0		6	0	4	6	6	0	8	15	6	11	3	65	
Total		15	129	46						104	81	5								25	6	7	31	15	5	22	21	11	34	13	190	

* Mil-Nur: Military Nurse, Civ-Nur: Civil Nurse, Med Doc: Medical Doctor, Tec: Technical, Vol-Nur: Volunteer Nurse.

** Eme: Emergency Depart, Gyn: Gynecology: MIR: Medical Inspection Room, Int: Internal Medicine, Lab: Laboratory, Mor: mortuary, Oth: Other from Ebola Survivors Clinic, Dental Department, X-Ray Department, Chest Clinic, Ophthalmology Department, Operation Theatre, Infectious Disease Control Unit, Pae: Paediatric Depart, Phys: Physiotherapy, Surg: Surgical Department, Und-Fiv: Under Fives Clinic.

Appendix

Table S1: Descriptive statistics for responses to the hand washing and medical sharps disposal (n=190)

Questions	Parameters / Answers	Percent %
After operation, how do you deal with the medical sharps? (Q10)	Directly disposing in dustbins.	3.7
	Deposit into the specified sharp-box immediately.	85.8
	First put them into the lower treatment trolley, then put them into the sharp box when get back to the office.	10.0
How do you deal with needles and syringes after using? (Q11)	Settle the needle back to the needle cap manually with Right and left hand.	11.1
	Settle the needle back to the needle cap with single hand.	17.4
	Remove the needle by hand and then discard it in the sharps box.	68.9
How many times were you injured by medical sharps during operation before? (Q12)	5 times or more	3.7
	Once	28.9
	2 -4 times	20.0
	Never	47.4
If you have been injured by sharps, what was the cause of the injury? (Q13)	Carelessness	21.6
	In a hurry	40.0
	Collision with others	6.3
	Inadequate lighting in work place	23.7
	Unskilled Operation	8.9
	Not followed with standardized protocol	22.6
	Poor quality of sharps	9.5
When did the injury (injuries) occur to you or your colleagues? (Q14)	When recapping the cap (no blood contamination)	37.9
	When recapping the cap (with blood contamination)	18.9
	When disposing medical supplies	12.6
	When removing the needle from the syringe or infusion set	31.1
	When breaking the ampoule split	52.1
	In the aspiration of the drug, dispensing drug	12.6
	When injecting, or collecting blood	13.7
	When pulling out the needle	16.3
	When transferring surgical blade, suturing wound or deal with other surgical instruments	18.4
Which kind of medical devices caused you or your colleagues` sharp injuries? (Q15)	Disposable intravenous infusion set	22.1
	Disposable syringe	20.5
	Scalp needle	43.2
	Indwelling needle	7.4
	Ampule	52.6
	Blade	35.3
	Sewing needle	10.5
What kind of awareness and skills of protection do you think you have been enhanced after Ebola outbreaks? (Q21)	Handwashing	34.2
	Disinfect the contaminated medical supplies timely	45.8
	Choose PPE in different area (eg. clean area, contaminated area)	49.5
	Wear gloves, masks when contacting with contaminated items	21.1

Questions	Parameters / Answers	Percent %
How often do you receive the occupational protection training course? (Q25)	Every six months	32.1
	Every year	31.1
	Never	25.8
	During the outbreak of endemic situation	0.0
	Occasionally but not regularly	4.7
	Every 3 months	1.1
What kinds of training course on protection knowledge have you received? (Q26)	Disinfection and isolation methods	55.3
	Occupational exposure and prevention	30.0
	Hospital infection control and monitoring	50.0
	Personal protection	75.8
How do you get the occupational protection knowledge? (Q28)	Clinical experience	59.5
	Professional protection training	54.7
	Medical school	37.4
	Regular supervision	24.7

Questionnaire on Knowledge, Attitude and Practices of Occupational Exposure and Protection of HCWS

Introduction and Consent

Hello everyone. I am Sister Qin from China Military Medical Expert Group, working in 34 MH now. We are conducting a survey on the knowledge, attitude and behavior of HCWs (health-care workers) in occupational exposure and protection. The study will help us to carry out one comprehensive training in the near future. The information will help the hospital to plan much better for nurses and health services. You are selected for the survey. I would like to ask you some questions and it may take about 15 to 20 minutes. All of your answers will be confidential and will not be shared with any other person except members of our survey team. We hope you will answer the questions accurately since your views are very important.

Thank you very much!

Please Tick（√） in the "☐ ", or Write the Figure

Part 1: General Information

Age: Years Old.

Sex: ☐ 1. Male ☐ 2. Female

Years of Working Experience: Years

Educational Qualification:

- ☐ A. Secondary school leaving certificate
- ☐ B. Nursing diploma certificate
- ☐ C. Bachelor's degree
- ☐ D. SECHN
- ☐ E. Lab technical diploma
- ☐ F. HCA
- ☐ G. Nursing certificate
- ☐ H. X--Ray technical
- ☐ I. Others

Occupation:

- ☐ A. Military Nurse
- ☐ B. Civil Nurse
- ☐ C. Volunteer nurse
- ☐ D. Medical doctor
- ☐ E. Lab technical
- ☐ F. X-Ray technical
- ☐ G. Others

Which Department do you Work in?

- ☐ A. Internal medicine
- ☐ B. Surgical Department.
- ☐ C. Emergency Department
- ☐ D. Paediatric
- ☐ E. Department of gynecology
- ☐ F. Under Fives Clinic
- ☐ G. Laboratory
- ☐ H. OP Theatre
- ☐ I. X-Ray dept.
- ☐ J. Physiotherapy dept.
- ☐ K. Dental dept.
- ☐ L. Ophthalmology dept.
- ☐ M. MIROOM
- ☐ N. Montuary
- ☐ O. Survivors clinic
- ☐ P. Others_

Part 2: Questions About Your Actual Practice

1. Do you like your job?

☐ A. Yes ☐ B. No ☐ C. Uncertain

2. How do you rate your level of occupational protection knowledge?

☐ A. Know well ☐ B. Common ☐ C. Know little

3. How do you rate your level of protection awareness?

☐ A. High ☐ B. General ☐ C. Low

4. Have you mastered the six steps in hand washing procedure?

☐ A. Yes ☐ B. No

5. Do you wash your hands before and after any sterile operation?

☐ A. Always ☐ B. Occasional ☐ C. Seldom

6. Do you implement hand washing following the correct six-step procedure after serving for the patient directly (eg.by touching or treatments)?

☐ A. Yes ☐ B. Occasionally ☐ C. No

7. How do you dry your hands after washing hands?

☐ A. With paper towels or single-use cloth towels

☐ B. With work clothes

☐ C. Not drying hands

8. Do you wear gloves when you do any operations those may contact blood or body fluids?

☐ A. Always (*skip to Q10*)

☐ B. Often but not every time

☐ C. Occasionally

☐ D. Never

9. Why do you operate without gloves? The reason is

☐ A. It's unnecessary to wear gloves.

☐ B. There isn't enough time to wear gloves.

☐ C. It's not convenient when operating with gloves.

☐ D. Gloves are not available .

☐ E. Shortage

☐ F. Others __.

10. After operation, how do you deal with the medical sharps?

☐ A. Directly disposing in dustbins.

☐ B.Deposit into the specified sharp-box immediately.

☐ C. First put them into the lower treatment trolley, then put them into the sharp box when get back to the office.

11. How do you deal with needles and syringes after using?

☐ A. Settle the needle back to the needle cap manually with right and left hand.

☐ B. Settle the needle back to the needle cap with single hand.

☐ C. Remove the needle by hand and then discard it in the sharps box.

12. How many times were you injured by medical sharps during operation before?

☐ A. 5 times or more ☐ B. Once

☐ C. 2 times ☐ D. 3 times

☐ E. 4 times ☐ F. Never (*skip to Q14*) ☐ J. Others_.

13. If you had been injured by sharps, what was the cause of the injury? (*You can select multiple answers according to actual condition*)

☐ A. Carelessness

☐ B. In a hurry

☐ C. Collision with others

☐ D. Inadequate lighting in work place

☐ E. Unskilled Operation

☐ F. Not followed with standardized protocol

☐ G. Poor quality of sharps

☐ H. Others _.

14. When did the injury (injuries) occur to you or your colleagues? (*You can select multiple answers according to actual condition*)

☐ A. When recapping the cap (no blood contamination)

☐ B. When recapping the cap (with blood contamination)

☐ C. When disposing medical supplies

☐ D. When removing the needle from the syringe or infusion set

☐ E. When breaking the ampoule split

☐ F. In the aspiration of the drug, dispensing drug

☐ G. When injecting, or collecting blood

☐ H. When pulling out the needle

☐ I. When transferring surgical blade, suturing wound or deal with other surgical instruments

15. Which kind of medical devices caused you or your colleagues` sharp injuries? (*You can select multiple answers according to actual condition*)

☐ A. Disposable intravenous infusion set

☐ B. Disposable syringe

☐ C. Scalp needle

☐ D. Indwelling needle

☐ E. Ampule

☐ F. Blade

☐ G. Sewing needle

☐ H. Others_.

16. Is the protective equipment supplied sufficient in the hospital?

☐ A. Yes ☐ B. No

17. Do you protect yourself from patients' blood and body fluids as potential sources of infection?

☐ A. Yes

☐ B. No

☐ C. Unclear

18. How do you deal with contaminated items from the patients?

☐ A. Clean with bare hands

☐ B. Clean with hands in gloves

☐ C. Clean with auxiliary equipment

☐ D. Others_.

19. If your skin contacted with patient's blood, body fluids, secretions, how do you deal with it?

☐ A. Wipe off with paper towel

☐ B. Rinse off with running water repeatedly

☐ C. Rinse with running water and disinfect

20. What kinds of protective skills training did the hospital or other health care facilities do after the Ebola outbreak? (*You can select multiple answers according to actual condition*)

☐ A. How to deal with sharps

☐ B. Six-step hand-washing technique

☐ C. When to wash your hands

☐ D. How to choose PPE (personal protective equipment) in different circumstances

☐ E. Disinfection methods

☐ F. Others_.

21. What kinds of awareness and skills of protection do you think you have been enhanced after Ebola outbreaks? (*You can select multiple answers according to actual condition*)

☐ A. Hand-washing

☐ B. Disinfect the contaminated medical supplies timely

☐ C. Choose PPE in different area (eg. clean area,contaminated area)

☐ D. Wear gloves, masks when contacting with contaminated items

☐ E.Awareness on ensuring clean areas are separate fromcontaminated area

22. Have you attended occupational protection courses before practicing in the hospital or other health care facilities?

☐ A. Yes ☐ B. No

23. Is it necessary to establish an occupational protection training course in your opinion?

☐ A.Necessary ☐ B.Unnecessary

24. Have you received any occupational training for prevention, post-event reporting and disposition?

☐ A. Yes ☐ B. No

25. How often do you receive the occupational protection training course?

☐ A. Every six months

☐ B. Every year

☐ C.Never

☐ D.During the outbreak of endemic situation

☐ E. Occasionally but not regularly

☐ F. Every 3 months

☐ G. Others_.

26. What kinds of training course on protection knowledge have you received? (*You can select multiple answers according to actual condition*)

☐ A. Disinfection and isolation methods

☐ B. Occupational exposure and prevention

☐ C. Hospital infection control and monitoring

☐ D. Personal protection

27. Do you think the hospital supervisor pay more attention to occupational safety andprotection?

☐ A. Yes ☐ B. No ☐ C. Don't care

28. How do you get the occupational protection knowledge? Multiple choices

☐ A. Clinical experience

☐ B. Professional protection training

☐ C. Medical school

☐ D. Regular supervision

29. How often do you disinfect the nursing equipment (eg. blood pressure monitors, temperature gun)?

☐ A. Not require disinfection

☐ B. Once a day, or at any time when contaminated with blood or other items

☐ C. Once a week, at any time when contaminated with blood or other items

☐ D. Unclear

☐ E. After each patient

☐ F. Others .

30. If the medical items are contaminated by the patient's blood, body fluids, how do you deal with it?

☐ A. Wash with water

☐ B. Wipe with disinfectant

☐ C. Wash with water immediately and disinfect

31. How often do you clean and disinfect the surface of trolleys or desks?

☐ A. Not require disinfection

☐ B. Once a day, or at any time when contaminated

☐ C. Once a week, at any time when contaminated

☐ D. Unclear

☐ E. Others.

Part 3: Questions About Your Knowledge

32. Multiple choices When should you wash your hands?

☐ A. Before & after direct contact with the patient

☐ B. Before & after removing gowns

☐ C. After removing the gloves

☐ D. Before & after injection, infusion and other sterile operation

☐ E. Before & after dealing with contaminated items

☐ F. Visible contaminants on hands

☐ G. Before putting on gloves

☐ H. Before putting on mask

33. Multiple choices When should you disinfect your hands?

☐ A. Contact with the patient's blood, body fluids and secretions

☐ B After directly examination, treatment and care for HBV patients

☐ C After removing the glove

☐ D Before & after putting on or removing gowns

34. Multiple choices What actions should you take when a sharp injury occurs:

☐ A. Rinse the wound with disinfectant.

☐ B.Rinse the wound with running water immediately and squeeze blood away from the body to the distal end.

☐ C. Rinse with soap under the running water. ☐ D. Report immediately and inject immunoglobulin following the doctors' advice.

35. Multiple choices What should a nurse wear when receiving a new patient with Fever of Unknown Origin?

☐ A. Mask

☐ B. Cap

☐ C. Gloves

☐ D. Face shield or goggles if necessary

☐ E. Coverall or gown if there is a certain epidemic situation

36. Multiple choices Standard precautions for medical personnel protection includes:

☐ A. Wear gloves when contact with patients' blood, body fluids, secretions, excretion

☐ B. Remove gloves and do hands hygiene after contact with contaminated items or exit from isolation ward

☐ C. Wear double gloves when there is a wound on your hands.

☐ D. Wear gown when entering the isolation ward, or contact with contaminated items

37. Multiple choices When should you wear gloves? Choosing from the following circumstances

☐ A. There is a wound or breakage on your hands.

☐ B. There is blood or body fluid on the instruments those you are dealing with

☐ C. When preparing chemotherapy drugs

☐ D. When performing sterile operation

38. Multiple choices What are the routes of transmission of HIV?

☐ A. Blood

☐ B. Body fluid

☐ C. Unprotected sexual contact

☐ D. Mother to child vertical transmission

☐ E. Handshake

☐ F. Hug

☐ G. Other_.

39. Multiple choices What are the routes of transmission of Hepatitis B Virus?

☐ A. Sexual contact

☐ B. Mother to child vertical transmission

☐ C. Body fluid

☐ D. Handshaking

☐ E. Others _.

40. How long is the best period to take prophylaxis for HIV after exposed to contaminated items of HIV patient?

☐ A. Within 2h

☐ B. 4h

☐ C. 24h

☐ D. Unclear

41. Multiple choices What should you do if blood from HIV patients splashed into your eyes?

☐ A. Wipe with a cotton swab immediately

☐ B. Rinse the mucosa of your eyes with water or saline repeatedly

☐ C. Rinse with water and use sanitizer

42. Multiple choices When should you go to have HIV antibody tests after exposed contaminated items of HIV patient?

☐ A. Immediately

☐ B. After 4 weeks

☐ C. After 8 weeks

☐ D. After 12 weeks

☐ E After 6 months

43. When should you report to your superior if you get a sharp injury?

☐ A. In 24 hours

☐ B. In 1 hour

☐ C. Immediately

☐ D. It needn't to be reported

☐ E. Unclear

44. Multiple choices What do you need to wear when receiving EVD (Ebola virus disease) patients?

☐ A. Face masks(eg.N99 or N95)

☐ B. Coverall

☐ C. Waterproof apron

☐ D. Double set gloves

☐ E. Rubber boots

☐ F. Head covering

☐ G. Face shield or goggles

45. When should you dispose the sharp box?

☐ A.When it is full

☐ B. When it is 1/2 full

☐ C. When it is 3/4 full

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Employee Satisfaction and Related Factors among Public Healthcare Workers in Sri Lanka: A Case Study on Regional Directorate of Hambanthota

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A majority 153 (59.5 %) of the public Health Officers-PHO had scored their level of job satisfaction as neither satisfied nor dissatisfied and 65 (23.7 %) are satisfied. However 39 (15.2 %) of the study population are not satisfied while 1.6% are strongly satisfied and none of them are strongly dissatisfied. A majority 226 (88 %) of the PHO are satisfied on support exerted at MOH level. More than half of the PHO are not satisfied on existing appraisal system, promotion based on work performance, extra payment and salary increment within the system.

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GJMR-K Classification: *NLMC Code: NLMC Code: WA 21*

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This study first of the nature in Sri Lanka and data are not available for comparison. Comparison between studies in local or international literature is difficult and inappropriate unless the working seek. Study shows that motivational factors affect more than hygienic factors to the employee. Experience as a PHO, presence of immediate supervisor, age of the PHO and number of children n has significant influence on job satisfaction while total population, mode of travelling, place of residence, and distance from place of residence to the field has no significant influence on job satisfaction. Improving basic facilities in working environment, appointing PHNS of SOHM for each MOH area, provision of efficient feed back at MOH level, conducting regular in service programmes to update the knowledge are the main recommendations.

Keywords: health work force, employee satisfaction, two factor theory of harzburg.

I. Introduction

Job satisfaction among public sector employees within Sri Lanka, specifically the health environment is becoming an area of major concern as highlighted by recent research studies and media reports. An exodus of professional staff and a lack of resources have exacerbated the current problem impeding on effective and efficient service delivery.

Literature validates that factors such as poor working conditions, staff shortages, below competitive salaries, a lack of promotional opportunities are some of the major factors contributing to employee dis-satisfaction within the sector (Ellickson & Logsdon, 2002; Herman, 2005; Ting, 1997).

Health care is defined as a 'multitude of services rendered to individuals, families, and community by agents of the health services or professions for the purpose of promoting, maintaining, monitoring, and restoring health (Last, 1988).

Job satisfaction is a frequent studies subject in work and organizational literature. This is mainly due to the fact that many experts believed that job satisfaction trends can affect labour market behaviour and influence work productivity, work effort, employee's absenteeism and staff turnover. More over job satisfaction is considered a strong predictor of overall individual well being (Diaz-Serrano, Jose, Cabral, 2005) as well as a good predictor of insertion or decision of employees to leave a job (Gazioglu, Tansel, 2004).

It has been shown that low job satisfaction is a major cause of turnover among health care providers (Marsland, O'Neill 2004). It affects the quality of service and organizational commitment (Yoder, 1995) and may be associated with staff shortages (Shader et al., 2001) or psychosocial stress. In the health care sector, only few organizations have made job satisfaction survey as a top priority. Also job satisfaction is important in everyday life. Organizations have significant effect on the people who work for them and some of the effects are reflected in how people feel about their work. These make job satisfaction an issue of substantial importance for both employers and employees, as they are more like to profit from lower staff turnover and higher productivity if their employees express a high level of job satisfaction.

Perhaps this is because; they have failed to understand the significant opportunity that lies in front of them. Satisfied employee tend to be more creative and committed to their organizations. Recent studies have shown a direct correlation between staff satisfaction an and patient satisfaction (Van de Looji, Benders, 1995).

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Hospital administrators who can create work environments that attract, motivate and retain hard-working individuals will be better positioned to succeed in a competitive health care environment demanding quality and cost-efficiency. What's more, they may even discover that by creating a positive workplace for their employees, they've increased their own job satisfaction as well. The premise of this research is focused on ascertaining how variables such as the work environment, pay, supervision, co-workers and promotion impacts on job satisfaction of civil servants at an institution residing under the Department of Health. According to Luthans (1989), high or low employee turnover rates, absenteeism and grievances lodged are factors that indicate whether job satisfaction or job dissatisfaction exists within organizations.

Previously highlights some of the major problems experienced within the Department being:

- Employee turnover rates;
- Major reasons why employees are leaving the department;
- Costs incurred due to sick leave taken;
- Types of misconduct addressed at disciplinary hearings and
- Grievances and disputes lodged.

So it's vital to carry out this type of research.

Unlike productivity, absenteeism and turnover, job satisfaction is present only inside an individual's mind and cannot be measured directly. Methods for indirectly measuring job satisfaction include observing employees, interviewing them and asking them to complete a questionnaire. Many organizations and researchers favour questionnaires because personal observations interviews are very time consuming (Gazioglu, Tansel, 2004). Job satisfaction can be measured using either single-item, general or facet measures.

According to Heller and Hindle (1998), Herzberg's two factors is a set of motivators that drives people to achieve. Nagy (n.d.) asserts that Herzberg's theory consists of two dimensions known as "hygiene" factors and "motivator" factors. According to Herzberg (1959) cited in Ruthankoon and Ogunlana (2002), the hygiene factors also known as extrinsic factors are the parts of the jobs which create dissatisfaction but, if not present, only return the worker to a neutral point of job satisfaction.

These job factors include supervision, interpersonal relations, benefits, job security, salary and working conditions. Herzberg states that hygiene issues cannot motivate employees but can minimize dissatisfaction and serve as a point of departure for motivation. On the other hand, satisfying motivator needs which are related to job tasks, job content and intrinsic aspects of the job can lead to job satisfaction, but the absence thereof cannot lead to job dissatisfaction (Robbins, 2003). According to Robbins et al. (2003), investigations conducted by Herzberg in terms of the intrinsic (motivators) factors and extrinsic factors (hygiene) suggest that the opposite of satisfaction is not dissatisfaction as was traditionally believed. The results of the studies reflected that the opposite of satisfaction is no satisfaction (motivators) and the opposite of dissatisfaction is no dissatisfaction (hygiene factors).

According to Schermerhorn (2003), Herzberg's two-factor theory is an important frame of reference for managers who want to gain an understanding of job satisfaction and related job performance issues. Schemerhorn asserts that Herzberg's two-factor theory is a useful reminder that there are two important aspects of all jobs: what people do in terms of job tasks (job content), and the work setting in which they do it (job context).

Schermerhorn suggests that managers should attempt to always eliminate poor hygiene sources of job dissatisfaction in the workplace and ensure building satisfier factors into job content to maximise opportunities for job satisfaction.

In this theory authors stated that job factors could be classified according to whether the factors contribute primarily to satisfaction or to dissatisfaction. Two aspect of the theory are unique and account for the attention it has received. Firstly two-factor theory says that satisfaction and dissatisfaction do not exist on a continuum running from satisfaction through natural to dissatisfaction.

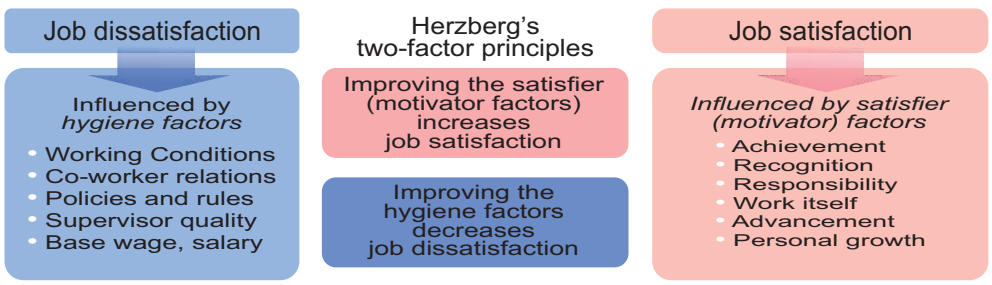


Fig. 2.1: Herzberg Two Factor Theory

An organization's polices can be a great source of frustration for employees if the polices are unclear or unnecessary r if not everyone is required to follow them (Michael Marsland, Ulmer, 2009) Although employees wills never feel a great sense of motivation or satisfaction due to company policies, it can decrease dissatisfaction in this area by marking sure your policies are fair and apply equally to all. Also, when printed copies of programme policies-and procedures manual easily accessible among all members of the staff and they will be more satisfied. It states that it is important to have a written manual and if you do not have a written manual, create one, soliciting staff input along the way. if already available consider updating it again, with staff input (Michael, Marsland, Ulmer, 2009).

Quality supervision is a prerequisite for effective worker practice. A good supervisor promotes family-centered philosophy, empowers, balances direction with need for worker autonomy, is available , serves as an ally and advocate foe saff, acknowledge effective job performance, prevents workers' accumulation of large amounts of overtime, and helps set priorities (Pecora, et al 2000) Inadequate supervision contributes to worker dissatisfaction which then may lead to turnover (Landsman, 2001) When supervision is perceived as inadequate or not supportive, workers may be more likely to be dissatisfied (Rycraft, 2004).

In situations where workers did not feel supported by their supervisions, other potentially negative working conditions became more significant (Samantrai 2002) On thwe other hand, supervisory support was found to be a critical factor in mediating the stress and frustrations of their job and motivating caseworkers stay.

II. Formulation of Research Objectives and Research Questions

a) Main Objective

To explore the level of job satisfaction in relation to hygienic and motivation factors and its correlates among Public Health Officers.

b) Specific Objective

1. To assess how hygienic and motivation factors affect job satisfaction
2. To make recommendations to improve the job satisfaction among Public Health Officers.

c) Research Questions

1. How hygienic factors affect to job satisfaction?
2. How motivation factors affect to job satisfaction?

d) Analytical Framework

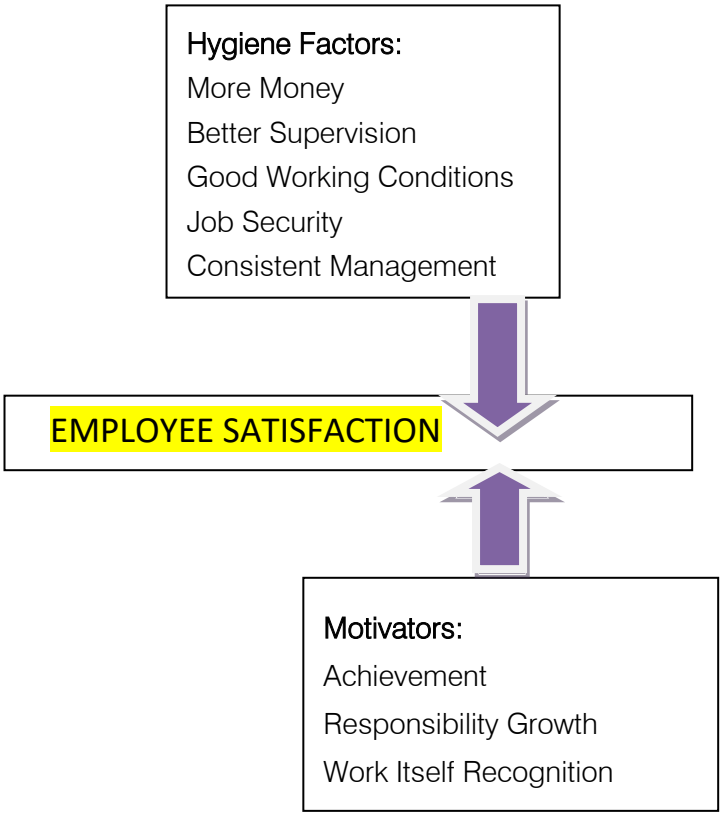


Fig. 2: Conceptual Framework

III. Method

By applying Research Onion

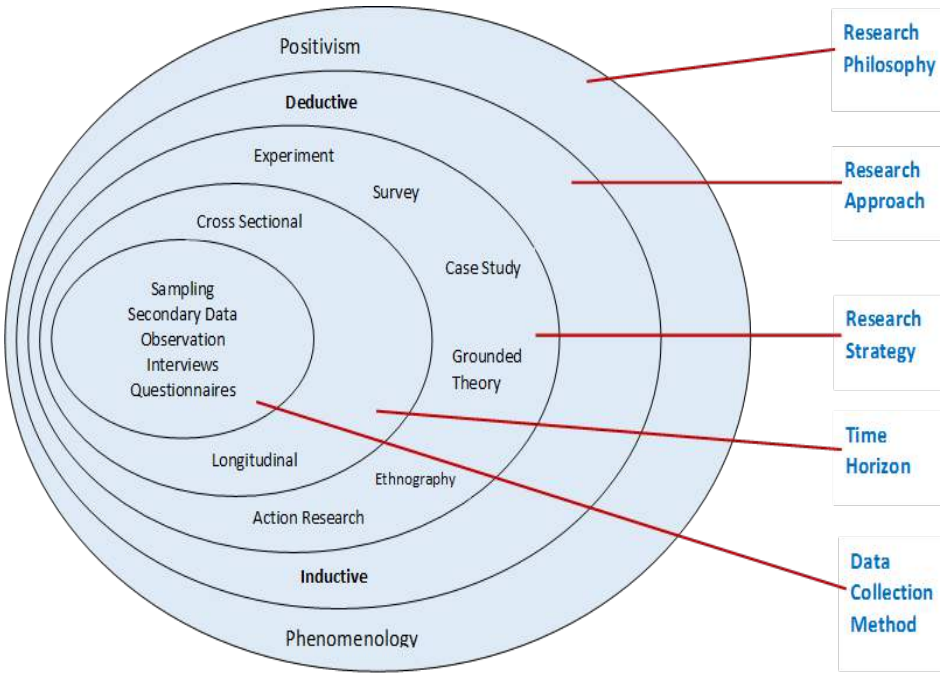


Fig. 3: Research Onion Source (Paulinus and David, 2013)

Philosophy of the Study: The study conducted with positivism approach as the philosophy due to limited time period. The research problem would be observed under quantitative data collection.

Research Approach: The Deductive approach used considering the availability of time through existing theories.

Research Strategy: A case element strategy would be used.

Time Horizon: Due to time constraints, the cross sectional time horizon would be used during September 2017 to October 2017 period.

Research Method: Quantitative methods used. A community based descriptive cross sectional study.

Research Tools: As the research tool, specific self administrated questionnaires would used.

Population and Sample Size: All the PHO who are working in the health administrative district of Hambantota will be selected as the study population. This includes 326 PHO who employed. All the Health Officers who fulfilled the inclusion criteria considered as the study sample. So this is a census. Therefore a sampling technique was not applicable.

a) Eligibility Criteria

Eligibility criteria used depend on their administrative structure and their field experience.

Data Collection Method: Primary data would be collected. Primary data collected through Self administered questionnaire and results of the questionnaires used for quantitative data analysis. (Annexure 1 - Questionnaire).

b) Instrument Development

Following a systematic review of the international literature pertinent to the subject in question, studies reporting on multidimensional job satisfaction instruments were collected on the basis of theoretical models that integrate the finding of empirical research related to satisfaction and motivation. The most common approach to measuring job satisfaction involves the use of questionnaires.

Data were collection primarily by the principal investigator himself. Data collection was carried out the monthly conference day as it is mandatory to all the Public health officers to attend monthly meetings at District office Hambantota. Those who are absent on the monthly conference day questionnaire was administered on next salary day.

c) Ethical Consideration

The research topic itself is ethical. The researcher would maintain the research at highly ethical level throughout the study. The researcher would not use his position or power to collect data by doing something harmful to someone else to get the data forcefully. During the research, would be specifically excluding the respondents as the minors, elderly and mentally unbalanced people.

d) Analysis of Data

Serial numbers were given to questionnaire at the stage of data entry. Data were coded and computer analysis was performed using Statistical Package for Social Science (SPSS) by principle investigator. Frequency and Chi square test was applied where appropriate to assess the significance of relationship. A probability of < 0.05 was considered as significant.

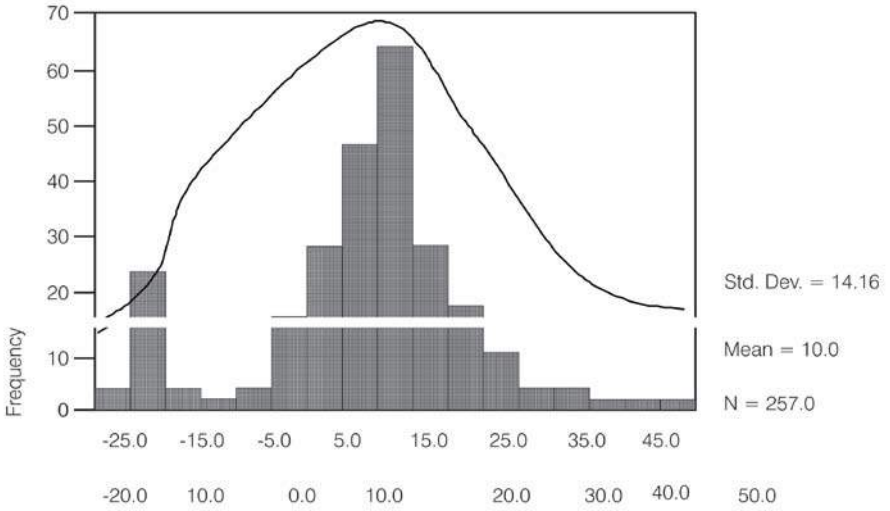
IV. Result

Frequency Distribution of Public Health Officers according to Final Level of Satisfaction

Level of Satisfaction	Frequency (N)	Percentage
Strongly Satisfied	4	1.6
Satisfied	61	23.7
Neither Satisfied Nor Dissatisfied	153	59.5
Dissatisfied	39	15.2
Strongly Dissatisfied	0	0
Total	257	100.00

According to the final score of satisfaction, more than half of the study population 153 (59.5%) is neither satisfied nor dissatisfied. Nearly one fourth of the study population 65 (25.3%) was satisfied (Strongly satisfied) with their job, while 39 (15.2%) of them were dissatisfied. None of them rated the level of job satisfaction as strongly dissatisfying.

a) Histogram and Binomial Distribution of Total Job Satisfaction with Final Score



Total Score for Job Satisfaction

Distribution of total score of job satisfaction follows a more or less normal distribution, but from – 20 to 5, there is some deviation from the normal distribution. SD is 14.15 and mean is 10.2. Final score of every questionnaire was taken by subtraction total minus count from total positive count; (See Section 4.9) then final score was categorized in to following five group as shown below.

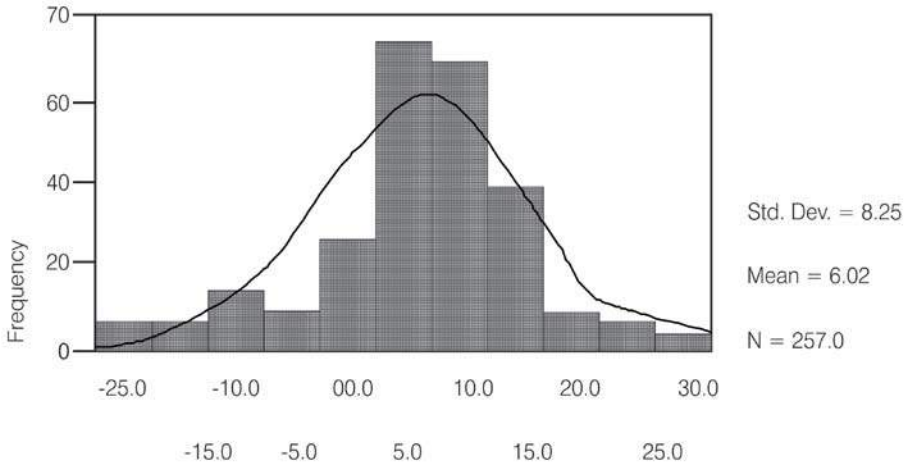
Frequency Distribution of Health Officers according to Responses to Variables Represent the Motivator (Satisfactory) Issues

Total Job Satisfaction	Frequency (N)	Percentage (%)
Strongly Satisfied	7	2.7
Satisfied	106	41.2
Neither Satisfied Nor Dissatisfied	133	51.8
Dissatisfied	11	4.3
Strongly Dissatisfied	0	0
Total	257	100.00

One hundred thirty three (51.8%) of study population has expressed that they are neither satisfied nor dissatisfied with variables which reflect motivator (satisfactory) issues and 113(43.9%) are satisfied with factors which reflect the motivator issues.

b) Histogram and Binomial Distribution of Job Satisfaction with Variables which Reflect Motivator (Satisfactory)

Distribution of Score from Satisfactory Variables



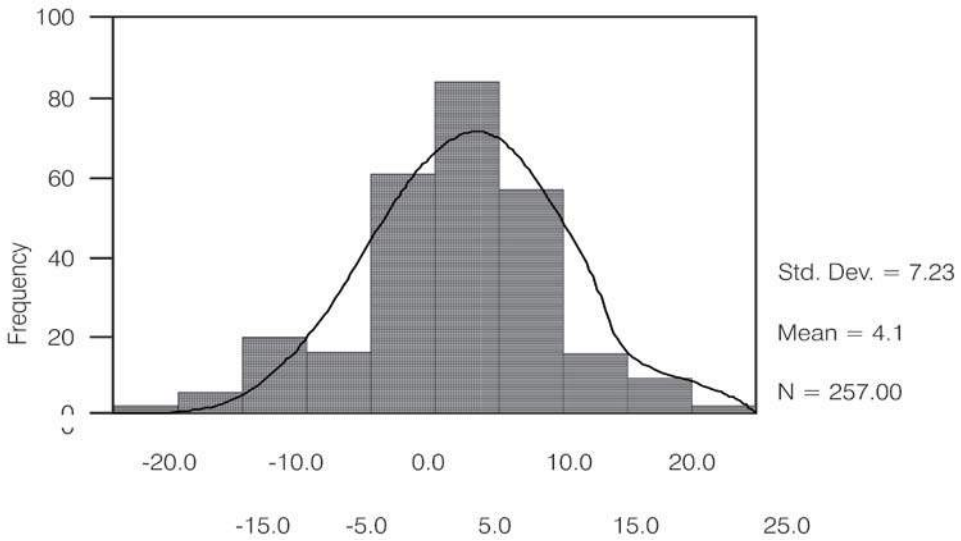
Total Score from Satisfactory Variables

Distribution of total score from motivator (satisfactory) is fallowing a more or less like normal distribution but - 5 to 5 has little deviation from normal distribution. SD is 8.25 and means 6.2.

Frequency Distribution of Public Health Midwives according to Responses to Variables which Represent the Dissatisfactory Issues

Scale	Frequency (N)	Percentage (%)
Strongly Satisfied	4	1.6
Satisfied	60	23.3
Neither Satisfied Nor Dissatisfied	176	68.5
Dissatisfied	17	6.6
Strongly Dissatisfied	0	0
Total	257	100.00

One hundred and seventy six (68.5%) of the study population has expressed that they are neither satisfied nor dissatisfied with variables which represent the satisfactory side and 64 (24.9%) were satisfied with factors relating to satisfaction.

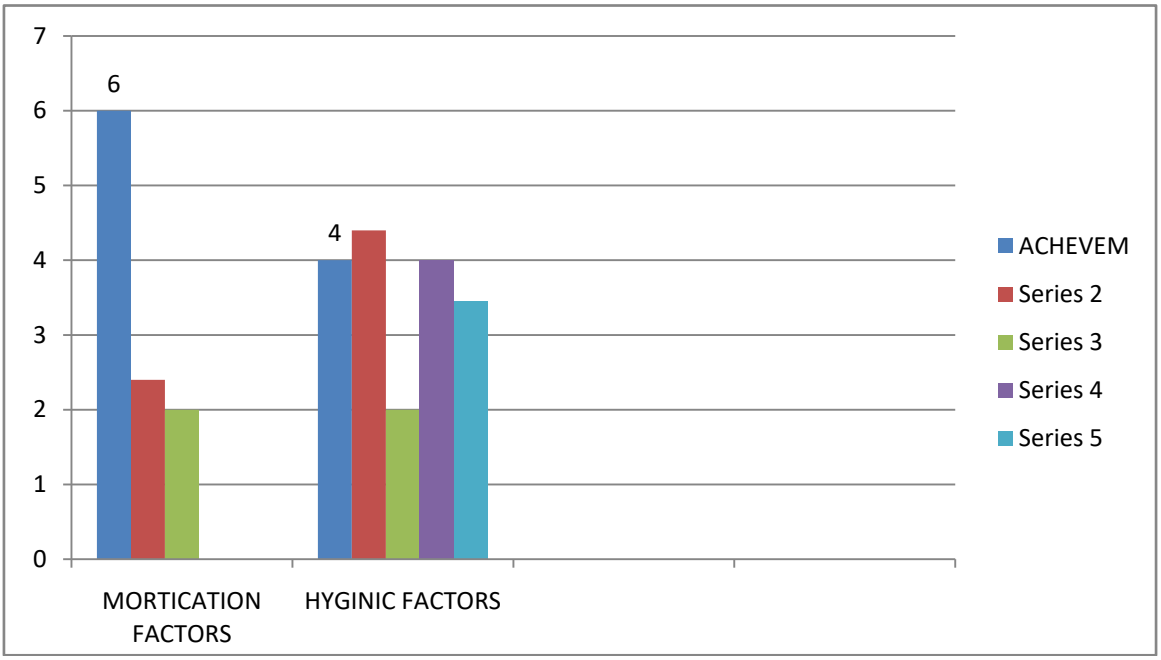


Distribution of Score from Dissatisfactory Variables

Distribution of final score from hygienic issues (dissatisfactory variables) are following a more less normal distribution but – 5 to 0 have some deviation from the normal distribution. SD is 7.23 and mean is 4.1.

c) Summary of Factors Affection Job Satisfaction

Variable	Mean	SD
1. Motivation Factors (Mean of Achievement (5.01) Responsibility (6.23) Growth, Work itself) (6.35)	6.02	8.25
2. Hygiene Factors (Mean of Money, (5.10) Supervision (4.25) Good working Condition (5.37) Job Security (4.59) Consistent Management (3.12)	4.10	7.23



d) Comparison of the Employee Satisfaction Factors

According to this comparison motivation affect more than hygienic factors .Among motivation factors responsibility has high mean value and among hygiene factors good working condition has high mean value.

e) Final Job Satisfaction

Appointing at least PHNS or SPHM for each MOOH area or re distributing existing available carder as it is expected to have at least one supervising for each MOH area, as availability of immediate supervisor has significant influence on the level of job satisfaction. Provision of effective feed back at MOH level to improve work performance. Improve the works appraisal system, scheme of promotions based on performance and also financial benefits as more than half of the study population were not satisfied with existing systems and this enhance the level of job satisfaction of the PHMM.

The central objective of this study was to establish the impact of variables, such as the work itself, pay, supervision, promotion and relationships with co-workers on employees in terms of job satisfaction at a public sector institution in the Western Cape. A literature survey was conducted to form the theoretical premise for the study. Factors such as pay, the work itself, supervision, relationships with co-workers and opportunities for promotions have been found to contribute to job satisfaction (Grobler et al., 2002; Johns, 1996; Nel et al., 2004; Robbins et al., 2003).

The empirical findings from the study indicate that employees at the public health The empirical findings from the study indicate that employees at the public health institution in the Western Cape, where the research was conducted, are most satisfied with their co-workers, followed by the nature of the work itself and the supervision they receive. They however, indicated that they are less satisfied with promotional opportunities and least satisfied with the pay they receive. The study revealed that 153 (59.5%) of study population is neither satisfied nor dissatisfied with their job and 65 (25.3%) of them rated their level of job satisfaction as satisfied (both strongly satisfied and satisfied), while 39 (15.2%) were dissatisfied. None of has rated as strongly dissatisfied while (1.6%) of them has rated as strongly satisfied.

Final score job satisfied had a medical of 12 (mean 10.245) while the medical for the motivators (satisfiers) and the hygienic (dissatisfied) were at 7

(mean 6.214) and 4 (mean 4.05) respectively. Therefore the final score had been more influenced by the variables which represent motivator (satisfiers) variables than hygienic or (dissatisfiers) variables. Eighty seven (33.9%) of the PHO working in Hambantota district had total field experiences as PHO for 16 to 20 years and majority 25 (9.7%) of PHO had worked as PHM for 4 years in the present station. Both minimum and maximum experience in station and total field experience as PHO were 1 (one) and 26 (twenty six) years, with a mean of 9.632 respectively.

Only 66 (25.7%) of the PHO are living in their quarters while majority 159 (61.8%) are living in their own home. Fifty six (21.8%) of the PHO were using moped as a mode of traveling, while 170 (66.1%) travelled by foot although there was no significant difference observed with the level of job satisfaction. Only 88 (34.2%), 63 (24.5%) of PHO had either PHO or SPO as their immediate supervisors respectively while 76 (29.6%) had both of them. However 30 (11.7%) of PHO do not have any of supervisors and this has statistically significant on the level of job satisfaction. Majority of the PHM are not satisfied with existing extra payment, salary increment, work load and facilities provided by the government, while they are satisfied with the support extended by MOH to solve the field problems.

More than half of the Public Health Officers working in Hambantota district, were not satisfied with the appraisal system within the institution and promotional scheme based on the work performance in comparison to private sector. The results of the study should be interpreted with caution due to the limitations of the study. Cognizance must also be taken of the fact that the results obtained from the research may be specific to the directorates where the investigation was conducted. This can be attributed to the fact that a non-probability sample in the form of convenience sampling was utilised in the study. Hence, the results acquired cannot be generalised with confidence to other public institutions .Another contributing factor impacting on generalisability is the fact that only the public health personnel were targeted in the study.

Therefore, the results of the study cannot be inferred to other occupational classes of a similar category resulting in the external validity of the study being compromised. In addition, although the response rate for the current study is adequate, the composition of the sample could have introduced elements of bias in the research findings. Final job satisfaction had a median of 12 (mean 10.245, while the median for the Motivator (satisfactory) variables and the hygienic (dissatisfactory) variable were at 7 (mean 6.214) and 4 (mean 4.05) respectively. This difference demonstrates that the total satisfaction score is more influenced by the Motivator (satisfactory) variables than the hygienic (dissatisfactory) variables.

V. Recommendations and Conclusion

When it comes to mobilizing staff, success is mainly based on ability to work with emotions. This means that you need to create an environment that is adapted to the development of positive emotions. Fostering professional and especially personal growth plays a major role in creating favorable sentiments towards organisation for employees. People who are encouraged to grow and develop are more likely to produce more efforts, push beyond their boundaries and deliver value in any task they undertake.

Provide Training Opportunities is important. Personal accomplishment is at the top of Maslow's pyramidal hierarchy of needs. That's why it's not surprising many of us develop a thirst for continuous learning and development. When you offer training opportunities, you give your employees the chance to deepen their knowledge and get specialised in a field they enjoy. As a matter of fact, training program are a win-win solution for employees and employers alike. And don't worry, bettering their skills will not increase their likeliness to fly away. It's actually an investment (and not an expense) your make for your employees which encourages them to stick around. Who wouldn't want to know that they are worth investing in them? Whether employees seek internal or external training, you should allocate them some time to spend specifically on their self-development.

- Organise a celebration or go out for lunch
- Plan a post-work drink with all the members of your organisation
- Write a personalised thank-you note

The best place where they belong will be organization that shares common values and interest. In order to motivate them, it is important to know what they are looking from life and where organizational goals can be the same as theirs, giving them a chance to pursuit their own ideology. The impact of intrinsic motivation has a very strong impact on their performance Some employee are mostly intrinsically motivated and individual attention from top management is highly powerful. They want to bring more in success of the company simply because they like to be here. If loyalists have a problem Increasing employee satisfaction and motivation with his or her current job position, it is better to assign him or her to another department or project where he or she has more expertise and skills. These people creating a strong chain in collective and losing them may cause very harmful problems.

To motivate an employee to perform certain activity, it is necessary to reward his or her achievement corresponding to his or her own appreciation that should be linked to the organization's goals. Management should carefully formulate realistic level of expected performance for its subordinates and inspire

them that they are able to achieve a desired goal only if they exert their force. The degree on how employees rate their strength depends on the management expectations. If the level of the expectation is high, the performance of subordinates is also probable to be intense. Otherwise if the level of expectations stands low, then the performance is expected to be low. If the expectations not exist, then the obstacles for achieving the goal generate a sense of futility.

The more value of non-achieved goal, the greater the sense of futility by following reduction of goal level, and if the goals are not realized several times, then the downturn of assessment of its reality and motivation will be lowered. Sense of futility reduces the motivation and as a result low motivation will mark down performing contribution to the goals.

It should be noticed that employees are able to achieve the desired degree of performance required only if that delegated powers and personal inputs are sufficient for the task accomplishment. The decisions you take can have a dual impact on employee satisfaction. Either positive or negative. Improving job satisfaction is a work of endurance that requires the collaboration and involvements of all. Job satisfaction brings motivation and triggers engagement, turning your employees into your organisation's best allies.

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Impact of Flood on Women's Sexual and Reproductive Health: An Empirical Evidence from Northern Bangladesh

By Abu-Hena Mostofa Kamal, Umme Umama, Shahrear Roman & Mohammed M. Khan

Khulna University of Engineering & Technology

Context- Women are the most vulnerable in any disastrous situation compared to their male counterpart. It is evident in several studies that among all other natural disasters flood causes immense sufferings for women especially in respect to their Sexual and Reproductive Health (SRH) due to the lower standard of living condition and poor institutional response.

Aims: The objective of this study was to understand the reproductive health status of women during the flood. The study also aimed to explore the effectiveness of existing reproductive health care services for women and adolescents during the flood.

Methods and Material: We used both qualitative and quantitative method in this study and our sampling procedure was purposive. We used a semi-structured questionnaire to collect data from 46 women in six villages under three different districts of Bangladesh, namely - Faridpur, Shariatpur and Sirajgonj. Moreover, five focus group discussion with the vulnerable women, ten exit interviews of the health care seeking women and five key informant interviews' of the local health care providers were conducted.

Keywords: disaster, reproductive, health, women, bangladesh.

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Aims: The objective of this study was to understand the reproductive health status of women during the flood. The study also aimed to explore the effectiveness of existing reproductive health care services for women and adolescents during the flood.

Methods and Material: We used both qualitative and quantitative method in this study and our sampling procedure was purposive. We used a semi-structured questionnaire to collect data from 46 women in six villages under three different districts of Bangladesh, namely- Faridpur, Shariatpur and Sirajgonj. Moreover, five focus group discussion with the vulnerable women, ten exit interviews of the health care seeking women and five key informant interviews' of the local health care providers were conducted. Besides, unstructured observation (both participatory and non-participatory) was also conducted in the studied communities.

Results: Findings of this study revealed that during flood women suffered more from leucorrhoea TID, pregnancy-related complexity, urinary infection and malnutrition compared to normal time. In contrast, poor responses by the institutions entitled to mitigate disaster-induced vulnerability enhanced sufferings of the victims.

Conclusion: Strengthening women-friendly disaster management program and enhancing institutional governance might be effective to reduce women's SRH vulnerability during a flood.

Keywords: disaster, reproductive, health, women, bangladesh.

Key Messages: Inadequate institutional response to reduce women's sexual and reproductive health-related vulnerabilities during flood.

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I. Introduction

During the year 2015, a total 376 natural disasters were recorded all around the world and from 2005-2014, a total of 380 natural disasters registered worldwide (Thomas, 2017). However, the death toll due to natural disasters in 2015 was 22,765, which shows a largely below the annual average number (76,416) compared to previous ten years and caused 110.3 million victims worldwide which was also below the annual average (199.2 million) (Thomas, 2017). Among the victim countries, Bangladesh is situated in South Asia which at present lies under the most threat ended categories of land for natural disaster. Between 1970 and 2005 a sum of 171 natural disasters were recorded in Bangladesh which caused highest natural disaster mortality rate in the world, with over half a million men, women and children lost to disaster events (Dankelman, 2008). The geographical location of Bangladesh and low-lying terrain have made it particularly vulnerable to two major forms of natural disasters and flood is one of them (Juran& Trivedi, 2015). On the other hand, damages and/or number of affected people due to flood was also higher than any other disasters (Bern et al., 1993; Dankelman, 2008; Doocy, Daniels, Packer, Dick, & Kirsch, 2013; Haque & Blair, 1992; Juran & Trivedi, 2015; Nasreen, 1995). Prior studies showed that the majority of the people of the flood-prone areas lived under poverty line and among all population women passed their life under distressed situation due to lack of proper social services (Azad, Hossain, & Nasreen, 2013; Enarson, 1999; Tom Mitchell et al., 2007; Nasreen, 1995). Disaster magnifies existing gender based inequalities and underpin disparity between men and women in respect to vulnerability and to cope with natural disasters (Azad et al., 2013). In Bangladesh, women and girls have less access to disaster risk reduction mechanisms as well as institutional services due to their socio-economic and cultural background than men which make them vulnerable and they experience higher fatality rates (Enarson, 1999; Tom Mitchell et al., 2007; Nasreen, 1995). Furthermore, women and girls have less access to response and recovery benefits (Enarson, 1999; Tom Mitchell et al., 2007; Nasreen, 1995). The cyclone and flood of 1991 was remarkable in disaster induced deaths in the country where the death toll was 1.4million and out

of the total deaths, 90% were women (Bang et al., 1989; Enarson, 1999; Tom Mitchell et al., 2007; Nasreen, 1995). Among all other problems encountered by women during flood, problems regarding their sexual and reproductive health were most crucial which has got less importance by the policy makers all around the world till date. Most of the girls and adolescence of Bangladesh usually suffer from various types of reproductive health problems (e.g. irregular menstruation, frequent birth giving, malnutrition, etc.). Women in rural areas suffer from several reproductive health problems in a certain time of their life span (Callaghan et al., 2007; Rahman, 2013). Women of the flood prone areas undertake extreme work load to survive or to lead their livelihood (Nasreen, 1995), which put them into fragile reproductive health conditions. Nonetheless, women and adolescents have unique health concern in the aftermath of flood (Islam, 2018). The women of flood prone areas have limited access to adequate food and nutrition, education and health facilities (Mitchell, Tanner, & Lussier, 2007; Nasreen, 1995; Parkinson, 2011; Rashid & Michaud, 2000). National and international communities who are dealing with reproductive health of women can't ensure their services during flood due to fragile communication system. Even the reproductive health issue has not been considered as the basic concern under flood management policy and/or act in Bangladesh yet (Rashid & Michaud, 2000). Over the past four decades, many extensive research have been carried out in Bangladesh on reproductive health of women. But no efforts have been undertaken to explore the condition of reproductive health of women during flood prior to this study.

II. Methodology

This study has provided insights into the dimensions of sexual and reproductive health related vulnerabilities encountered by women of northern Bangladesh during flood. Both quantitative and qualitative research methods were used to collect data regarding women's sexual and reproductive health. We used semi-structured survey questionnaire (46) to explore the socio-demographic information of the respondents, the nature of women's vulnerabilities and impact of flood on women's sexual and reproductive health. The closest contact (both participatory and non-participatory observation) with flood-affected women and direct observation of their challenging life enabled great objectivity of our research. Moreover, we conducted key informant interview (5) with the health care providers, focus group discussion (5) with the flood prone community people and exit interview (10) with the health care seeking women. We tried to understand the status of sexual and reproductive health problems of women under disastrous condition, especially during flood. We selected six most flood affected villages (Baliadangi and Amirabaj village of Faridpur district, Tarabunia and Madhu Sarkar Gram village of Shariatpur district and South Khashkaulia and BilShuvogasa of Shirajgonj district).We purposively selected eight flood affected women from each village and six from one village for questionnaire survey. In addition, we conducted focus group discussion in each of the five villages; 10 exit interviews in two union community clinics. However, we also selected five local health service providers (two quacks, two healers' and one religious priest) to understand the existing health care services of the study areas.

III. Ethical Consideration

The protocol was approved by internal Faculty of Institute of Disaster Management and Vulnerability Studies (IDMVS), University of Dhaka. Information has been collected in a neutral investigator.

IV. Results

The findings of the study revealed women's sexual and reproductive health related vulnerability during flood and institutional responses to mitigate the vulnerability of the flood affected women in the study area. The followings are the overview of the status of sexual and reproductive health and institutional responses for the flood affected women.

a) Socio-Demographic Background of the Respondent

Geographically the study areas were located in char (char is a tract of land which is surrounded by waters of an ocean, sea, lake, or stream and isolated from the main land) (Parkinson, 2011), area where the respondents passed their life under continuous risk of flood. According to the respondents, flood visited the study area seven times between 2002 and 2013. The findings of the study showed that the mean age of the respondents was 29.98 (ranging between 15-55). Majority of the respondent's (87.27%) occupation was housekeeping. Besides their household activities, a significant number of the respondents (56.56%) said that they were involved in rearing livestock and some respondents (41.50%) were involved in home yard vegetable gardening. Most of the respondents (61.23%) were illiterate; 14.13% respondents passed their secondary level education (class VI-X). The findings of the study also demonstrated that 13% of the respondents had their own income and the income level ranged from 500-1400 BDT. Moreover, family income of the respondents ranged between 2000 and 4000 BDT; 7% respondents mentioned that their monthly family income was approximately 4000 BDT. All the respondents said that they faced trouble to get reproductive health service during flood. Furthermore, 68.13% respondents mentioned that the mean distance of nearby health care centre was 3.5 km.

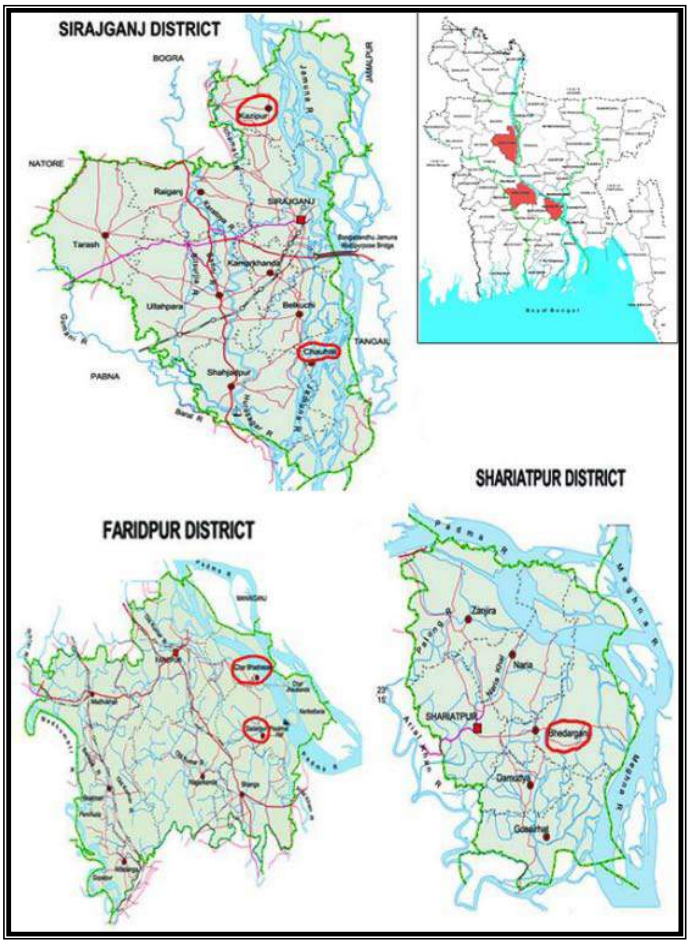


Fig. 1: Map of the Study Area

b) *Disaster and Prevalence of Sexual and Reproductive Health Problems*

During disastrous situation women pass their life under distress situation (Sánchez-Hernández, Castellanos-Vázquez, & Rivera-Tapia, 2013). Furthermore, disaster makes the life of women more complex, especially in respect to their sexual and reproductive health (Chen, Liu, Zeng, Ma, & Zhang, 2006), The findings of the study revealed that in pre-flood period 17% respondents suffered from Leucorrhoea TID (discharge of thick, whitish or yellowish substance from uterus) (Nelson, Meadows, Cannon, Morton, & Martin, 2002). Some respondents also mentioned that they suffered from Menorrhea (7%) (extreme or over days bleeding during period) (Shabir, 2013), waist pain (6%) and urinary infection (4%). On the other hand, the findings of the study also showed that all the respondents said that they suffered from Leucorrhoea TID and urinary infection during flood. Besides, a significant number of respondents mentioned that they suffered from malnutrition (65%), pregnancy related complexity (47%), involuntary abortion (23%) and waist pain (12%) (see: figure-2).

One of the FGD participants faced severe problems regarding her reproductive health during the flood of 2012. According to her description:

> *"Flood causes immense problem for the women and teenage girls of this area in respect to their reproductive health. Sanitary goods and reproductive health care services are not available here. Moreover, we live in a char area and during flood it becomes much more difficult for women like us to survive. We remain under water and in wet cloth most of the time which causes skin disease and urinary infection."*

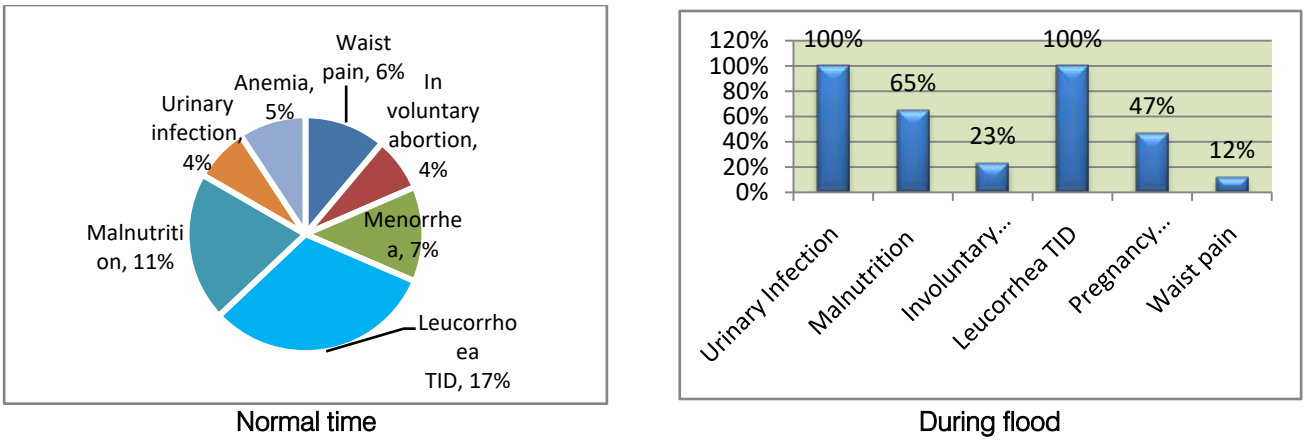


Fig. 2: Reproductive Health Status of Women

Source: Field Data 2013

c) Reproductive Healthcare Service during Flood

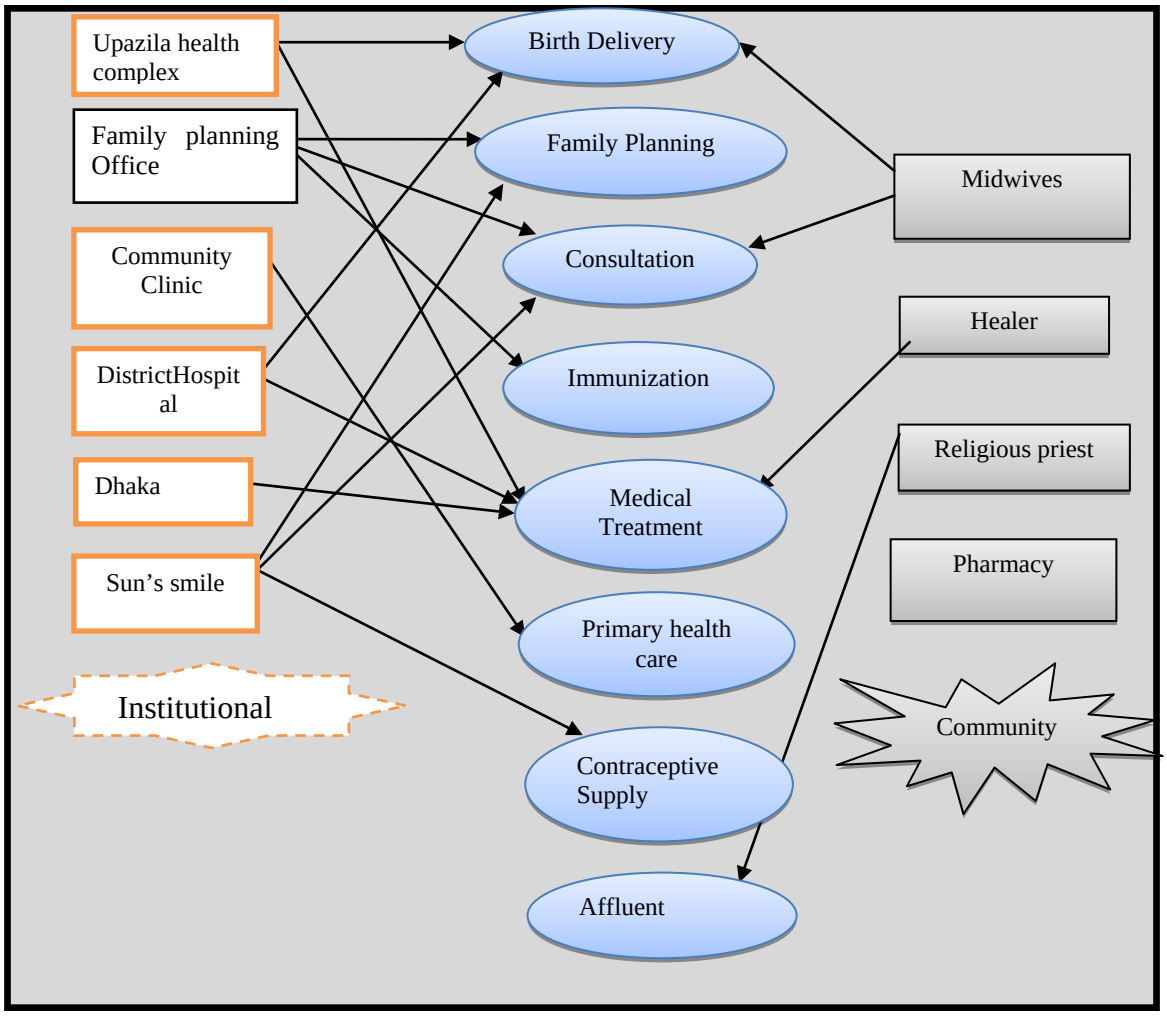
One of the major problems during flood according to the participants was to move from one place to another. Flood affected people (especially women) faced difficulties to move from one place to another. All the respondents mentioned that there was no specialized health care service for sexual and reproductive health in their locality. They added that it was almost impossible to get access to health care services due to their geographical scattered location, their poor economic condition and socio-religious dogma. One of the village doctors of the study area mentioned that the key problems to get access to reproductive health care for the female was socio-religious superstitions. He said that:

> *"…women feel ashamed to visit male physician for their reproductive health problems; they even think that it as a sin to share their problems with male person (locally called porpurus). But there is no MBBS doctor in our area and if we want to visit those doctors we need to cross 10 kilometres from here this becomes almost impossible for women. So, women of our area either stay at home or collect enchanted water ('panipora') from local religious priests."*

There were two available sources for reproductive health care services in the study area as the findings revealed. In broader sense, first one was institutional, and second one was non-institutional services. The institutional service providers involved Upazila Health Complex, family planning office, community clinic, district hospital and Sun's Smile clinic. On the other hand, according to the description of the study participants, non-institutional service providers involved- midwives, healer, religious priest and local pharmacy. A majority of the respondents (93.5%) mentioned that the services provided at the institutional level were not enough to mitigate vulnerabilities of women during flood. One the other hand, all the respondents mentioned that during last flood they relied mainly on midwives, traditional healer, and religious priests for reproductive health care services. Some respondents (58.54%) mentioned that they took services from local pharmacy. The participants who depended on institutional services reported that they had taken help for emergency birth delivery, to get contraceptive, consultation and immunization. On the other hand, all the participants said that they mainly relied on reproductive health services from community level institutions, like midwives, healer, religious priests and drug house. One of the participants said that:

> *"We do not get proper support from any institutions. So, we mainly rely on services from our community level. …we mainly share our problems with aged women of our family or sometimes outside of our family. Sometimes we also go to' Maulana' (religious priests) of the local mosque to have solutions for our personal problems. Besides, we also call midwives for pregnancy related complications and birth delivery during flood."*

Three other participants mentioned that due to insufficient reproductive health care services women faced tremendous problems during their menstruation period. One of the participants added that during flood most of the time women stayed under water, even during their menstruation period, but they did not have any access to sanitary goods. Besides, they remained with their wet clothes which caused urinary infection. They concluded that most of the time they did not get cured with the treatment received from their community level but they did not have any other alternative to get access to better treatment.



Source: Field Data, 2013

Fig. 3: Institutionalization of Reproductive Health Care Services

d) Dynamics of Reproductive Healthcare Services During Flood

Access to reproductive health care services was hindered by various socio-economic issues during flood, as the respondent mentioned. A majority of the respondents (88.70%) reported that due to long distance they failed to get access into existing health care services. On the other hand, 87.30% of the total respondents noted that due to their poor economic condition they did not seek health care services. Moreover, a significant number of respondents (83.60%) also mentioned about guardian's prohibition and religious barriers to take health care services from outsiders and especially from male service providers and or from distant places(See:Table-1).

Table 1: Problems Encountered by Women taking SRH Services

Reasons of not taking RH Service	Percent
Long Distance	88.70%
Unpleasant Service Provider's Behavior	10.60%
Lack Of Service Provider's Expertise	67.10%
Long Waiting Time	13.60%
Inadequate Drug Supply	23.60%
Too Expensive Service	21.40%
Religious Dogma	83.60%
Economic Problem	87.30%
Prohibition by Guardians	83.60%

*multiple responses

S ource: Field data, 2013

One of the participants described her personal experiences during last flood while she was passing her menstruation period. She said that:

"My menstruation period (locally known as 'mashik') started during the last flood which made me to suffer a lot. From the very begging I ignored the problems, I mean secretion of white fluids ('sadaseraf') and severe lower abdominal pain. …I had to stay in wet clothes almost all the day and I could not dry my clothes even at night as there was no proper space to do so. I passed 15 days through this situation and till now during my menstruation period excessive blood comes out with the menstrual rags."

Another vulnerable woman reported that women's dress code became problematic during flood. She reasoned that generally women used to have more clothes compared to their male counterparts. But during flood they remained long time with their wet clothes. And thus due to traditional dress codes women became more vulnerable compared to their male counterpart.

The local health service providers faced multifaceted problems as they mentioned. All the health care providers participated in this study reported that they did not have proper resources, like skilled doctor, especially female doctor, adequate supply of drugs and sanitary goods, to serve the health care seeking people. Moreover, they also mentioned that during flood due to fragile communication service women form long distances failed to go to community health clinic. In addition, they also said that women of the villages felt shy to discuss about their personal reproductive health related issues with male person. One of the local quacks said that:

"Most of the people of our area are Muslim and they maintain strong veil (purdah) system. Besides, male persons of the family do not allow them to go to health complex, especially for reproductive health care service."

Participants of this study asserted that due to collapse of communication, women became more vulnerable in respect to their reproductive health care services. Nonetheless, they also mentioned that there was lack of strong social structure to ensure proper services for women.

V. Discussion

Disaster is gender neutral, not vulnerability (Kshirsagar, Shinde, & Mehta, 2006; Tom Mitchell et al., 2007). Flood causes enormous problem for women in respect to their reproductive health. From our study it has been observed that the study participants lived in a geographically scattered area where they had poor socio-economic settings. A small number of the respondents had their own income. This finding suggests that in order to have access to better access to health care services women had to depend on their family. In addition, their family incomes were also below moderate. Again, the findings of the study also revealed that during normal time they faced problems regarding their reproductive health but those problems increased to a large extent during flood. Similar type of problems was faced by women during the Pakistan flood in 2010 (Ruth, 2009) and Mumbai flood in 2005 (Ali, 2014). However, the findings suggested that women's dress code was a passive cause behind their reproductive health related problems. Research has consistently revealed that women's traditional clothing, like- sari, causes difficulties to run or swim during emergency situation (Ali, 2014; Ruth, 2009).

The participants of this study reported that they mainly depended on non-institutional or community level services for their reproductive health related problems. They also mentioned about their socio-religious constraints to get access into reproductive health services. Geographical locations, lack of strong social structure, collapse of communication services, prevalence of diseases, lack of sanitary goods and nutritious food supply and socio-religious dogmas were some other reasons behind the reproductive health related vulnerability of women during flood, as the findings suggested. The study conducted by Zarqa S. Ali (2014) is also suggestive of similar findings (Ali, 2014). The study finally suggested making the governmental and non-governmental organizations to be proactive about providing reproductive health care services for women and taking it as the key concern of disaster health governance.

VI. Conclusion

Bangladesh is recognized as one of the most vulnerable countries in the world in terms of frequency and intensity of natural disasters. Due to the geographical location, the country faces several disasters almost every year. Natural disasters like cyclone, flood, drought, landslides, etc. have been causing huge impact on economy, infrastructure and life over the decades. The findings of the current study revealed that flood disrupts the normal life style of the women of the northern part of Bangladesh. They become vulnerable in respect to their reproductive health care services. In general, women are regarded as the household manager and the burden of managing both household chores and health care issues of her and the other members of the family is also shouldered on women. Besides, due to traditional socio-cultural structure women fails to share the problems of their own, especially problem regarding reproductive health care related problems. Rather than sharing these types of problems with others, women try to solve the problems using indigenous coping mechanisms or taking the help from the community

people, like religious priests, midwives, local pharmacy and very few people go outside to have better treatment facility. The people of the villages of Bangladesh still believe that it is uncomfortable to share their physical problems with outsiders and or with male persons. Due to flooded situation, it becomes almost impossible to go from one place to another. So, it could be another reason of women's sexual and reproductive health related complications. The participants of the current study mentioned that arranging mobile health care services and using boat for the flood affected people would be a very good initiative to mitigate vulnerabilities of the affected people. Besides, raising awareness for women and adolescents through health education would help to reduce vulnerability during flood or any other disasters. The participants also recommended reducing cost for health care services so that they may get easy access to health care services in the future. To conclude, it can be said that in Bangladesh women are half of the total population and most importantly women are regarded as better disaster manager compared to their male counterpart. So, it is important to ensure good health care services for women so that they can manage other disastrous situation and in order to ensure good physical condition for women it is necessary to consider and/or incorporate reproductive health care issue into mainstream disaster management policy.

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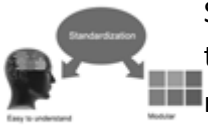

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Once you are designated as MARSM, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria.

It is mandatory to read all terms and conditions carefully.

AUXILIARY MEMBERSHIPS

Institutional Fellow of Open Association of Research Society (USA) - OARS (USA)

Global Journals Incorporation (USA) is accredited by Open Association of Research Society, U.S.A (OARS) and in turn, affiliates research institutions as "Institutional Fellow of Open Association of Research Society" (IFOARS).

The "FARSC" is a dignified title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., FARSC or William Walldroff, M.S., FARSC.

The IFOARS institution is entitled to form a Board comprised of one Chairperson and three to five board members preferably from different streams. The Board will be recognized as "Institutional Board of Open Association of Research Society"-(IBOARS).

The Institute will be entitled to following benefits:

The IBOARS can initially review research papers of their institute and recommend them to publish with respective journal of Global Journals. It can also review the papers of other institutions after obtaining our consent. The second review will be done by peer reviewer of Global Journals Incorporation (USA) The Board is at liberty to appoint a peer reviewer with the approval of chairperson after consulting us.

The author fees of such paper may be waived off up to 40%.

The Global Journals Incorporation (USA) at its discretion can also refer double blind peer reviewed paper at their end to the board for the verification and to get recommendation for final stage of acceptance of publication.

The IBOARS can organize symposium/seminar/conference in their country on behalf of Global Journals Incorporation (USA)-OARS (USA). The terms and conditions can be discussed separately.

The Board can also play vital role by exploring and giving valuable suggestions regarding the Standards of "Open Association of Research Society, U.S.A (OARS)" so that proper amendment can take place for the benefit of entire research community. We shall provide details of particular standard only on receipt of request from the Board.

The board members can also join us as Individual Fellow with 40% discount on total fees applicable to Individual Fellow. They will be entitled to avail all the benefits as declared. Please visit Individual Fellow-sub menu of GlobalJournals.org to have more relevant details.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

After nomination of your institution as "Institutional Fellow" and constantly functioning successfully for one year, we can consider giving recognition to your institute to function as Regional/Zonal office on our behalf.
The board can also take up the additional allied activities for betterment after our consultation.

The following entitlements are applicable to individual Fellows:

Open Association of Research Society, U.S.A (OARS) By-laws states that an individual Fellow may use the designations as applicable, or the corresponding initials. The Credentials of individual Fellow and Associate designations signify that the individual has gained knowledge of the fundamental concepts. One is magnanimous and proficient in an expertise course covering the professional code of conduct, and follows recognized standards of practice.

Open Association of Research Society (US)/ Global Journals Incorporation (USA), as described in Corporate Statements, are educational, research publishing and professional membership organizations. Achieving our individual Fellow or Associate status is based mainly on meeting stated educational research requirements.

Disbursement of 40% Royalty earned through Global Journals : Researcher = 50%, Peer Reviewer = 37.50%, Institution = 12.50% E.g. Out of 40%, the 20% benefit should be passed on to researcher, 15 % benefit towards remuneration should be given to a reviewer and remaining 5% is to be retained by the institution.

We shall provide print version of 12 issues of any three journals [as per your requirement] out of our 38 journals worth $ 2376 USD.

Other:

The individual Fellow and Associate designations accredited by Open Association of Research Society (US) credentials signify guarantees following achievements:

- The professional accredited with Fellow honor, is entitled to various benefits viz. name, fame, honor, regular flow of income, secured bright future, social status etc.

- In addition to above, if one is single author, then entitled to 40% discount on publishing research paper and can get 10%discount if one is co-author or main author among group of authors.
- The Fellow can organize symposium/seminar/conference on behalf of Global Journals Incorporation (USA) and he/she can also attend the same organized by other institutes on behalf of Global Journals.
- The Fellow can become member of Editorial Board Member after completing 3yrs.
- The Fellow can earn 60% of sales proceeds from the sale of reference/review books/literature/publishing of research paper.
- Fellow can also join as paid peer reviewer and earn 15% remuneration of author charges and can also get an opportunity to join as member of the Editorial Board of Global Journals Incorporation (USA)
- • This individual has learned the basic methods of applying those concepts and techniques to common challenging situations. This individual has further demonstrated an in–depth understanding of the application of suitable techniques to a particular area of research practice.

Note :

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- In future, if the board feels the necessity to change any board member, the same can be done with the consent of the chairperson along with anyone board member without our approval.
- In case, the chairperson needs to be replaced then consent of 2/3rd board members are required and they are also required to jointly pass the resolution copy of which should be sent to us. In such case, it will be compulsory to obtain our approval before replacement.
- In case of "Difference of Opinion [if any]" among the Board members, our decision will be final and binding to everyone.

"

Preferred Author Guidelines

We accept the manuscript submissions in any standard (generic) format.

We typeset manuscripts using advanced typesetting tools like Adobe In Design, CorelDraw, TeXnicCenter, and TeXStudio. We usually recommend authors submit their research using any standard format they are comfortable with, and let Global Journals do the rest.

Alternatively, you can download our basic template from https://globaljournals.org/Template

Authors should submit their complete paper/article, including text illustrations, graphics, conclusions, artwork, and tables. Authors who are not able to submit manuscript using the form above can email the manuscript department at submit@globaljournals.org or get in touch with chiefeditor@globaljournals.org if they wish to send the abstract before submission.

Before and during Submission

Authors must ensure the information provided during the submission of a paper is authentic. Please go through the following checklist before submitting:

1. Authors must go through the complete author guideline and understand and *agree to Global Journals' ethics and code of conduct,* along with author responsibilities.
2. Authors must accept the privacy policy, terms, and conditions of Global Journals.
3. Ensure corresponding author's email address and postal address are accurate and reachable.
4. Manuscript to be submitted must include keywords, an abstract, a paper title, co-author(s') names and details (email address, name, phone number, and institution), figures and illustrations in vector format including appropriate captions, tables, including titles and footnotes, a conclusion, results, acknowledgments and references.
5. Authors should submit paper in a ZIP archive if any supplementary files are required along with the paper.
6. Proper permissions must be acquired for the use of any copyrighted material.
7. Manuscript submitted *must not have been submitted or published elsewhere* and all authors must be aware of the submission.

Declaration of Conflicts of Interest

It is required for authors to declare all financial, institutional, and personal relationships with other individuals and organizations that could influence (bias) their research.

Policy on Plagiarism

Plagiarism is not acceptable in Global Journals submissions at all.

Plagiarized content will not be considered for publication. We reserve the right to inform authors' institutions about plagiarism detected either before or after publication. If plagiarism is identified, we will follow COPE guidelines:

Authors are solely responsible for all the plagiarism that is found. The author must not fabricate, falsify or plagiarize existing research data. The following, if copied, will be considered plagiarism:

- Words (language)
- Ideas
- Findings
- Writings
- Diagrams
- Graphs
- Illustrations
- Lectures

- Printed material
- Graphic representations
- Computer programs
- Electronic material
- Any other original work

Authorship Policies

Global Journals follows the definition of authorship set up by the Open Association of Research Society, USA. According to its guidelines, authorship criteria must be based on:

1. Substantial contributions to the conception and acquisition of data, analysis, and interpretation of findings.
2. Drafting the paper and revising it critically regarding important academic content.
3. Final approval of the version of the paper to be published.

Changes in Authorship

The corresponding author should mention the name and complete details of all co-authors during submission and in manuscript. We support addition, rearrangement, manipulation, and deletions in authors list till the early view publication of the journal. We expect that corresponding author will notify all co-authors of submission. We follow COPE guidelines for changes in authorship.

Copyright

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Appealing Decisions

Unless specified in the notification, the Editorial Board's decision on publication of the paper is final and cannot be appealed before making the major change in the manuscript.

Acknowledgments

Contributors to the research other than authors credited should be mentioned in Acknowledgments. The source of funding for the research can be included. Suppliers of resources may be mentioned along with their addresses.

Declaration of funding sources

Global Journals is in partnership with various universities, laboratories, and other institutions worldwide in the research domain. Authors are requested to disclose their source of funding during every stage of their research, such as making analysis, performing laboratory operations, computing data, and using institutional resources, from writing an article to its submission. This will also help authors to get reimbursements by requesting an open access publication letter from Global Journals and submitting to the respective funding source.

Preparing your Manuscript

Authors can submit papers and articles in an acceptable file format: MS Word (doc, docx), LaTeX (.tex, .zip or .rar including all of your files), Adobe PDF (.pdf), rich text format (.rtf), simple text document (.txt), Open Document Text (.odt), and Apple Pages (.pages). Our professional layout editors will format the entire paper according to our official guidelines. This is one of the highlights of publishing with Global Journals—authors should not be concerned about the formatting of their paper. Global Journals accepts articles and manuscripts in every major language, be it Spanish, Chinese, Japanese, Portuguese, Russian, French, German, Dutch, Italian, Greek, or any other national language, but the title, subtitle, and abstract should be in English. This will facilitate indexing and the pre-peer review process.

The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.

Manuscript Style Instruction (Optional)

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11'", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

a) A title which should be relevant to the theme of the paper.
b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
d) An introduction, giving fundamental background objectives.
e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
f) Results which should be presented concisely by well-designed tables and figures.
g) Suitable statistical data should also be given.
h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
j) There should be brief acknowledgments.
k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.

Format Structure

It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

All manuscripts submitted to Global Journals should include:

Title

The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

Author details

The full postal address of any related author(s) must be specified.

Abstract

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Keywords

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, “What words would a source have to include to be truly valuable in a research paper?” Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.

Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

Preparation of Eletronic Figures for Publication

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

Tips for writing a good quality Medical Research Paper

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of medical research then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.

6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

INDEX

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