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Communication study

Doctors' experience of stress during simulated bad news consultations

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ABSTRACT

Objective: Breaking bad news (BBN) is a core component of medicine. Psychophysiological studies confirm the subjective reports of doctors that BBN is a stressful experience. This study investigated doctors' physiological stress responses prior to and during two simulated bad news consultations.
Methods: Thirty-one doctors participated in a speech-interaction task and two simulated BBN consultations. Heart rate (HR) and skin conductance (SC) were recorded using consecutive 30-s epochs during each of the interactions. The simulations were video recorded.
Results: Most doctors showed an early anticipatory increase in HR and SC that peaked during the reading of the case history prior to the BBN consultations. Most doctors then experienced a brief and relatively small stress response. However, about one-third of the doctors showed a significant and sustained stress response.
Conclusions: The results suggest that most doctors were cognitively engaged with the BBN tasks, however, a small proportion of doctors might have focused more on their own internal feelings and less on these contextual features.
Practice implications: In regards to training medical students and doctors, these results suggest that there is a need to focus more on the impact of these encounters on the *doctors*, not just their performance during these encounters.

1. Introduction

Breaking bad news (BBN) to patients and their families is a core communication task in medicine, and the responsibility for delivering bad news often comes early in a doctor's training [1–3]. Doctors often report that BBN is a stressful experience; for example, they report approaching the task with apprehension, fear, and anxiety [4–6], and have difficulty separating their own emotions from the clinical situation [7].

A number of studies have utilised simulation methodologies and physiological indices to empirically describe doctor's stress responses to BBN. One study conducted by our group [8] measured heart rate (HR) and HR variability (HRV) among 24 senior and junior doctors as they delivered bad news (i.e. cancer diagnosis) and good news (i.e. non-cancer diagnosis) to a simulated patient. All clinicians showed a significant increase in HR and a decrease in several HRV indices during the bad news task, relative to the good news task, especially in doctors who were less experienced or fatigued.

Several studies have examined medical student responses and report similar findings. For example, relative to a good news task (i.e. non-cancer diagnosis), medical students showed higher HR, blood pressure (BP), and subjective distress when delivering a cancer diagnosis [9]. Higher HR and cardiac output have also been reported in medical students who delivered the news of an HIV diagnosis, relative to a history-taking task [10]. Finally, Van Dulman et al. [11] report that the anticipation of BBN by medical students was associated with increased cardiovascular activity, serum cortisol levels, and subjective anxiety, but when they addressed the emotional concerns of the *patient* they experienced a reduced stress response [11].

However, there is a lack of clarity as to how a doctor's stress response will evolve over time and in association with the BBN task. For example, is anticipation of the task associated with a peak in HR or does the peak occur during the delivery of the news? It is also not clear whether there is variability in the stress responses of different doctors. Thus, a more fine-grained analysis of the trajectory of the stress response is required. In this study, we evaluated the temporal structure of doctor's stress responses before and during two simulated BBN consultations, and their

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responses were sorted post hoc into different response groups, based on visual inspection of the data.

Ptacek and Eberhardt [12] have proposed a theoretical model to explain doctor's stress responses to BBN, based on the Transactional Model of Stress and Coping [13]. The model posits that doctors will experience anticipatory stress when they prepare for BBN. The stress response will then peak during the bad news consultation, and then rapidly dissipates once the news is delivered. The model also posits that doctor's experiences of BBN stress are predominantly cognitive in nature; with the doctors typically making a cognitive appraisal of the stressful situation and the available resources they have to deal with it. Thus, doctor's stress responses are expected to peak during the BBN consultation and be related to their cognitive appraisal of the contextual features (e.g. patient or family member) of the consultation.

There is some preliminary evidence suggesting that this model has utility in explaining BBN stress [8]. Our group has previously examined the impact of prior BBN experience and severity of the news (good vs. bad news) in a group of doctors [8]. In addition, three studies have investigated the potential impact of the severity of the news in medical students [9–11]. In this study, we explicitly evaluated the accuracy of the model in explaining the temporal response of doctors during the BBN task.

This conceptualisation of doctor's stress responses is consonant with earlier work by Oken [14], suggesting that a doctor's initial BBN experience may come to influence how they approach such interactions in the future. In addition, the theoretical approach is consistent with doctors' prior reports that BBN interactions are stressful [15,16].

1.1. Aim of the study

In accordance with the limited available literature demonstrating increased physiological arousal associated with the delivery of bad news, relative to the delivery of good news [8], the purpose of this study was to empirically assess *how* doctor's stress responses (i.e. HR and skin conductance) changed before and during the course of two BBN consultations. Specifically, we hypothesised that: HR and SC will initially increase in anticipation of BBN, remain elevated or increase further during the delivery of the news, and then decrease once the news has been delivered, returning to baseline by the end of the consultations.

2. Materials and methods

2.1. Participants

This study was conducted with full ethical approval from the Human Research Ethics Committee of the Northern Sydney Central Coast Area Health Service. *Junior Medical Officers (JMOs)* – interns and residents, and *Senior Medical Officers (SMOs)* – registrars and staff specialists/consultants were invited to participate in the study. The recruitment of SMOs involved one author (SD) approaching heads of departments with a request to advise their staff about the study. If they were interested, SMOs were contacted about the study by a second author (JS). JMOs volunteered after a presentation on the study at JMO clinical education meetings (to SD).

Thirty-one doctors (21 male, 10 female; mean age 36.6 years, SD = 11.2) who were employed in one of a number of metropolitan hospitals in Sydney, Australia, were recruited, including 22 SMOs and 9 JMOs across a range of specialities including oncology ($n = 9$), general surgery ($n = 6$), obstetrics/gynaecology ($n = 3$), emergency medicine ($n = 3$), cardiology ($n = 3$), paediatrics ($n = 3$), infectious diseases ($n = 1$), rheumatology ($n = 1$), respiratory medicine ($n = 1$), and general medicine ($n = 1$).

2.2. Questionnaire measures

2.2.1. Demographic questionnaire

Immediately prior to participation, each doctor completed a short questionnaire about demographics such as age, gender, general medical practice characteristics, and experience in BBN (i.e. estimated frequency). Doctors were also asked to rate their overall health and fitness using a four point Likert scale from 1 (*poor*) to 4 (*excellent*). Since the impact of caffeine on heart rate is well recognised [17], we recorded the doctor's consumption of tea/coffee and other caffeinated drinks prior to the simulation. Medications that are known to affect cardiac function were also documented.

2.2.2. BBN-specific perceived stress

Immediately after the two BBN consultations, doctors were asked to rate the degree of perceived stress they experienced during the BBN simulation. This stress response was rated using a 5-point Likert-type scale ranging from 1 (*not at all stressful*) to 5 (*extremely stressful*).

2.3. Physiological measures

During the two simulated consultations, heart rate (HR) and skin conductance (SC) were recorded using the ProComp Infinity 8-channel, multi-modality encoder (Thought Technology Ltd, Montreal, Canada), connected to a laptop computer equipped with Biograph Infinity software (version 3.1.6, Thought Technology Ltd, Montreal, Canada). Data was dumped to the laptop in real-time, and a video recording of the interactions enabled the synchronisation of physiological data with the simulation activities. HR was recorded using a three electrode ECG sensor (Thought Technology Ltd.), with a sampling rate set at 2048 Hz. The placement of the Ag–AgCl electrodes was according to the standard ECG configuration. SC was recorded using a pair of Ag–AgCl electrodes attached to the non-dominant hand, and connected to a sensor that excited the electrodes, using a constant voltage of 0.5 V. The sampling rate was set at 256 Hz.

The Biograph Infinity software (version 3.1.6) was used to convert raw ECG signals to inter-beat intervals (in milliseconds), reported as beats per minute (bpm). SC (μS) was recorded and the number of fluctuations was counted manually. SC was considered to have changed if there was a fluctuation of greater than 0.05 μS from the preceding SC value [18,19]. HR and SC were both reported in consecutive 30-second epochs over the entire length of the two consultations.

A variety of different physiological measures might potentially have been used in this study. HR and SC were chosen as they are well-accepted proxy measures of autonomic arousal that do not require invasive collection methods and are not likely to distract the participating doctors during this naturalistic set of tasks (e.g. blood pressure cuff may distract some doctors) [20,21].

2.4. BBN scenarios

Two medical scenarios that dramatised two patient deaths were extracted from hospital medical records. The first scenario involved a wife in her mid-forties being informed of the death of her husband, aged 57-years, who presented with a suspected heart attack three days earlier. He was successfully managed with medication and was recovering well prior to a second cardiac arrest, and the second resuscitation was unsuccessful. The second scenario involved an adult daughter being informed of the death of her mother, aged 72-years, from the complications of heart surgery to repair a blocked artery. Although technically difficult, the surgeon had been able to successfully graft the artery and the