

Kavita Vedhara

‘Imagine the brave new world... these are small psychological interventions capable of big effects’

Our editor Jon Sutton meets Professor Kavita Vedhara (University of Nottingham)



We're here at the Psychobiology Section conference. Everybody these days accepts that link between the 'psycho' and the 'bio'. What is it that you are doing to take the study of that relationship to the next level? I'm not unique in being interested in this, but the one thing that's really characterised my work, even from the early days of my PhD, has been trying to establish the *relevance* of those relationships. It's all very well showing some really nice well-controlled experimental studies where you see an association between, let's say, stress and the immune system not working as well. But I've always wanted to know, What difference does that make?

One of the criticisms people have had of the work that I have done is that I have moved around diseases... one minute it's HIV, the next it's the diabetic foot, and really that's because I've never found myself wedded to a disease entity. Some people do, they get a name for doing work in a particular disease context, but I've always been interested in the underlying question.

Can you give me an example from that HIV work? Here was a disease that attacked the immune system directly. In my limited understanding of disease at the time, I thought this is bizarre... here is a disease that impacts on your ability to fight all other illnesses, what is that? Understanding that psychology or emotional distress can also undermine your immune system, straight away the question for me was, What happens if a person is HIV positive and they are depressed, does that mean they die faster?

That was essentially what I was asking in my PhD: What's the clinical relevance of that relationship between our psychological functioning and those biological consequences? We found that people who at baseline had higher levels of emotional distress were dying faster, they were losing more CD4 cells over time. That wasn't related to their own perceptions of the severity of the disease.

You can't get much more important than whether people die or not. In your talk yesterday, you introduced me to the diabetic foot ulcer and just how serious a condition like that is – and how impacted it can be by what's going on mentally.

I was reading this lovely experimental stuff coming out of the States saying that wound healing was delayed by short periods of stress, and I just thought, 'What happens if it's not an experimental wound?' All those little puncture marks, they're going to heal at some point. What really happens when that wound takes a long time to heal? I don't think I had ever heard of a diabetic foot ulcer. I was scratching my head thinking, 'What kind of chronic wound?' I started talking to some clinical colleagues and they said the obvious chronic wound is the diabetic foot ulcer, but you don't want to look at that, that's really messy, really complicated, you'll never find an effect of psychological factors on that! But then the more I looked into it, the more I realised it was a hugely underresearched area, an important clinical problem, and actually there was every reason to expect that there would be some psychological influences, because we know that people are distressed when they get these wounds, we know they last a long time... it seemed alien to me that there wouldn't be psychological factors at play.

And what psychological factors did you end up finding?

Unexpectedly, we found an effect of confrontational coping. Normally you would expect that to be a protective mechanism, because it epitomises people wanting to be actively involved in the management of their health and do something about it. 'I've got this wound, it won't get the better of me', that kind of spirit. But we found, and it's the classic unexpected but interesting finding that makes you think again about what's important... when we saw this coming out, my first thought was, 'Oh no, we've entered the data incorrectly!' We went back, but sure enough, people who were more confrontational were much less likely to heal.

Why?

Our post-hoc explanation was that these patients appear to be left very uncertain about what they need to do to manage these wounds. We did quite a lot of qualitative work as part of this study, and it wasn't uncommon for people to say to us, 'It's really confusing, my nurse says one thing, my GP says another, my podiatrist says something else... I'm going to do what makes sense to me.' The anecdote that sticks in my mind is the gentleman who said, 'As soon as I get home, I take off my socks and shoes and I just make sure the air's there, keep the wound dry, walk

around on the carpet because that soaks it up...' As I heard this, I'm thinking, 'Surely you can see that's a bad idea?', but for him it made complete sense.

Surely with most conditions, in most medical contexts, that is the case, that people get conflicting advice? A lot of the public health campaigns, for example around cancer, have increasingly become based on confrontational coping, but I doubt that the quality of information about what people should actually do to 'kick cancer's butt' has actually got any clearer. Do you think those campaigns are going down the wrong route?

My sense would be that they are short-sighted. Take the 'five portions a day' campaign. If you fundamentally believe that people get cancer because they smoke, or they have bad genes, whatever you think the causes are, and somebody comes along and says 'eat fruit and veg', that's putting a round peg into a square hole, that's not going to make any sense to them and therefore they are not going to enact that behaviour. I remember a talk that John Weinman gave, to do with a guy who had lost his sense of smell, and all of the medical information he was getting made

no sense to him, it didn't fit in with his belief about why he had lost his sense of smell. As long as you are in that predicament, you're not going to be able to get people to change their behaviour, because they don't see the relevance.

To this guy drying up his weeping wound on the carpet, he had a memory that it was really important for his feet to be dry. That's where patients' beliefs about their illness are hugely influential in understanding why people do what they do.

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And patients' beliefs more broadly about their mortality?

Yes, we measured patients' beliefs about their ulcers, at baseline... when we got to the end of that, five years later, I started to become aware of this other literature on how beliefs can affect mortality in other chronic diseases that were not dissimilar to diabetes. Unfortunately 50 per cent of patients die within five years – higher than the mortality rates for the most common cancers. So we observed that identity beliefs at baseline, that is patients' beliefs about their symptoms, predicted mortality up to nine years later. It was a very enduring effect. But what was most interesting to me was not just the statistical significance of identity beliefs, but looking at what else identity beliefs correlated with, and that's when we start seeing this cluster of beliefs patients had which were clearly putting them at risk of death within that follow-up period. So these were patients who believed their ulcers had a huge effect on them emotionally, that

they would last for a long time, that they couldn't do much to influence the outcomes...

And they didn't actually have worse ulcers?

Yes, we controlled for the size, number of previous ulcers, infection, all the things you might think would make a difference to whether or not somebody died, even when you put those in the model identity beliefs are still important.

Just going back to clinical relevance... one aspect of that is getting the right help to the people who need it most. One thing that was news to me from your work is that vaccines don't work equally well with everybody, and that there are all kinds of psychological factors that might affect that.

Absolutely. They don't work as well in older people, and people who are experiencing negative mood, whether it is stress or depression. So the first study I did looked at chronically stressed carers, who are experiencing a double whammy. They've got two reasons why the vaccinations might not work for them – an ageing immune system, and chronic stress compounding that effect. We found that the flu vaccine didn't work as well in our chronically stressed caregivers. Only about 27 per cent of caregivers were protected against flu after vaccination, compared with a control group where it was more like 65 per cent.

Caregivers are important to our society, both in terms of their ability to give care but also their own wellbeing – they're vulnerable themselves. In a time of rationed resources in the NHS, one of the ways forward is to ask which people would benefit most from psychological interventions which could optimise the effectiveness of their treatments.

You mention resources. One of your findings is that the mood on the day of vaccination can make a difference to how effective it is. That brings to mind the possibility of fairly brief, simple interventions, but that's going to cost money and time. Does it cost more money if it doesn't happen?

As part of any analysis we would look at the cost effectiveness, but my sense is that if we can develop some kind of brief intervention that can be delivered on a tablet or phone, with individualised content...

Is it a funny dog video? People like funny dog videos. It's not a funny dog video. Maybe next time we'll put in a funny dog video, for you. At the moment it has a bit of *Fawlty Towers*, *Two Ronnies*... bear in mind we're aiming at an older age group.

Del Boy falling through the bar, that kind of thing?

We didn't think about that! That is a classic. But my sense is that once you develop those kinds of things, particularly if they are delivered digitally, they don't cost a lot of money. Have it on in the waiting room. If you can even increase the effectiveness of the vaccinations by 10–15 per cent, for a price that's

probably cheaper than the vaccination, you could increase the likelihood that it's protecting people. Because it's quick and cheap, you can think about it being a public health intervention, so everyone gets it during flu season. Imagine the brave new world, in which they send you your appointment and at the same time you download that year's positive mood intervention, watch it on the day of your appointment, go get your vaccination, bingo – it improves it 10 per cent and costs peanuts to deliver. Certainly the effect size of the positive mood work – we haven't published yet, it's under review – it's the same as you see for cholesterol-lowering medication. These are potentially small psychological treatments capable of big effects.

These are all 'vaccine adjuvants' – can you give me some other examples?

I like to think that the direction of travel for most of my work is effectively developing psychological adjuvants. One way in which our discipline can make a difference to health is by saying, 'These are the pathways, these are the clinical mechanisms'... so take fertility, we know that the success rate of IVF has not changed in decades, it's about 25 per cent. Let's say that the findings we've got recently, on cortisol affecting the effectiveness of IVF, are robust... we could be talking about developing some kind of lifestyle intervention to put in place before people go for a round of IVF, to modify their levels of the hormone so it's optimised before treatment, to increase the chances that it works. That becomes a psychological adjuvant. You're taking an existing treatment and optimising it, by adding something to the mix. It's the same with where we want to go with the wound-healing work. The classic way that diabetic foot ulcers are managed is that you get regular appointments, you go once or twice a week, for maybe several months, the wound is cleaned, it's debrided, you have antibiotic treatment if it is infected... if we add into that mix a psychological treatment that enables patients to really understand which bits of the management of their foot health they can influence, like 'You need to look at it regularly – if you see any changes, get an appointment straight away', there are things that they can do and things that they can't do, and a lot of the difficulty for that patient group is not knowing which is which. Feelings of low control are really common in that patient group – if we can do something to enable them, the hypothesis would be that we'll see better outcomes.

You work in a medical school. Are your more medically minded colleagues on board with this input? Has that changed over the years?

Thankfully yes it has. I'm really fortunate – I don't know if Nottingham is unique in this, but I certainly feel that my medical colleagues are completely on board with the fact that psychology has got something to offer medicine. I do not feel that is a battle I have to win. That compares favourably with my very first conversation with a clinician, years ago, when I was

doing my PhD – a gentleman who was a consultant in infectious diseases, managing the local HIV population at the time. I went with my supervisor to have a chat with him... he was incredibly polite, but was very clear that he thought what I was doing was a complete waste of time. He said, 'It's clearly not going to have any effect whatsoever, it's all about the disease, it's a very powerful infection, there's not going to be a role for psychological factors here, but I don't mind if you come in and do it, be my guest.' Almost 'What harm can you do?' He was humouring me. I think he was blown away when we got the results that we did.

It comes back to the data, and from your talk I can see you're fond of systematic reviews. You don't want to waste your time on things that aren't going to have a decent impact, and with that kind of approach to research and gathering together other people's research you're going to make persuasive arguments to people who need persuading.

That's an interesting point, I've not really thought about it before, and that's maybe something that's happened almost subconsciously. But I've become aware of the sort of evidence that persuades clinicians that what we are doing is important, and systematic reviews are absolutely up there. The vaccine work is a case in point – I wanted to take it forward but it has been quite difficult to get that work funded. It was about five years ago that I thought, 'I need to start by

just systematically reviewing the literature, so that we can say this is what's out there, this is what we know, this is what we know about the effect size.' There was work out there, but it's very clear there's a huge amount of scope to do this work even better, and instead of operating in silos where we might look at physical activity, or diet, or mood, we look across the data and see what would work best. Had we not done the review and the subsequent observation study, I wouldn't have got to mood on day of vaccination in a month of Sundays.

These methods exist and we should use them, because they allow us to be more convincing to funders and collaborators, but also it's really important that we make the best use of the data that's already out there. That's in keeping with the idea of open science, and data repositories, so that we can say, 'Here I am, 10 years later, can I take a look at this question now?' It's a fascinating and brilliant opportunity if used appropriately. I think that is the future for science.

And do you make best use of the data in your personal life?

Possibly not! I've got two small children... you have no time for yourself. I look forward wistfully to the day I can resume getting fit. I used to do a lot of running, but at the moment I'm fairly sedentary and probably don't eat as well as I should do. But it's getting better! I'm aware of what my goals are.



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