

**(TC: 00:00:00)**

**Dr Hazel Wallace: Hey team, welcome back to the Food Medic podcast. I'm your host, Dr Hazel Wallace, medical doctor, nutritionist and author. Today we're discussing breast health in sports and exercise, which is a topic that I'm personally fascinated by and always banging on about. Did you know that the first sports bra was made, home made actually, in 1977 out of two jock straps sewn together. Thankfully, we have come a long way since the jock bra, but we are really only starting to appreciate how important adequate breast support is when exercising.**

**So, today I am very lucky to be joined by Dr Jenny Burbage, who is the associate head in school of sport health and exercise science at the University of Portsmouth. Her primary research area is breast biomechanics and breast health but interests in breast pain, poor bra fit, functional breast support and the effect of breast support on performance. Her PhD was focused on investigating breast support implications for female recreational athletes. Dr Burbage has worked with a number of national and international parallel companies and bra manufacturers since 2007. Over the last seven years, she's been running breast science workshops for the industry. Jenny has published over twenty peer-reviewed papers and presented at numerous national and international conferences. Again, this podcast has a female focus, but it is intended for everyone to listen to, and so while these conversations may start here, I'm hoping you guys will continue them with your friends, family and colleagues. So, take notes and enjoy.**

**First of all, thank you so much for joining us on the Food Medic podcast. The first thing I would love to know a bit more about is your research background and the work you're doing with the research group in breast health at the University of Portsmouth.**

**(TC: 00:03:06)**

**Dr Jenny Burbage: Yes, so I have an undergraduate degree in sport and exercise science. So, that's really my background. And then from a sports science degree, I was really interested in how the body moves. So, I went on to do a masters degree specifically in biomechanics for sport and exercise. So, that was trying to understand a bit more about how we can measure how the body moves and look at the forces, for instance, that we apply to the ground, and how that might help us to try and improve performance within sport, or to reduce the risk of injury. And it was whilst I was doing that that I had the opportunity to become a research assistant on the first ever project into sports bras and sports bra support at the University of Portsmouth. And this was a fascinating area and I realised that when I started looking into this, how little research had been undertaken in this area. So, I basically didn't look back from that point, and from my masters, carried on working as a research assistant, collecting some initial data looking at how the breast moves during activity and how sports bras might help to reduce that movement. Then I effectively went on to do a PhD part time looking at the breast support implications for female recreational athletes and I've continued from there,**

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really interested in sports bras, how they affect women whilst they're exercising. And then I've specifically, more recently, gone into looking at more functional breast support during occupational activities.

So, I'm currently working with the military, for example, to understand how we might help them to achieve good breast support for their female recruits. I've also been looking into horse riding as a specific sport and what we might be able to do there. So, really interesting research and still so much to do in this area.

**(TC: 00:05:11)**

**Dr Hazel Wallace: Yes, absolutely, and I can't wait to talk more about that research, because like you said, there's still a lot more to do and sports bras are relatively new and I think the first one was essentially home made back in the 1970s, and how have sports bras evolved since? How much do we know now? And why did it take so long?**

**(TC: 00:05:36)**

Dr Jenny Burbage: It did take a long time. It's really surprising to think that the first sports bra was only really around in the late 1970s and I think a lot of focus went into developing athletic shoes and footwear and trainers and that's where a lot of, from a biomechanics perspective, I think that's where a lot of the research went. And we just didn't really start looking at the science behind bras for another decade later. So, there's a couple of early studies, some brief research done, one in the 1980s, one early 1990s and it wasn't really until we got into the 2000s that the scientific research arena caught up and started really having an impact and really trying to help to inform the design of the bra products. So, there're certainly developments since the initial bras in terms of fabric technology and designs, and I think generally we're still basing a lot of these sports bras on three main styles. And I think that hasn't necessarily changed. What's changed is the addition of different adjust-ability, different ways we can do up the bra and undo the bra and different materials. And the whole time we've got this compromise between providing good support to the breast through the sports bra, but also for that bra to be comfortable as well. So, still very challenging and although the bras have evolved, I still think we have some way to go to still be able to meet the needs of female athletes who are wearing them.

**(TC: 00:07:18)**

**Dr Hazel Wallace: Yes, absolutely. And I think there's also the barrier for more recreational athletes or people who are just generally taking part in exercise who are also looking for something that's aesthetically pleasing.**

**(TC: 00:07:33)**

Dr Jenny Burbage: Definitely.

**(TC: 00:07:33)**

**Dr Hazel Wallace: And sometimes that trumps the other factors. Which is why I'd love to chat more about why it's so important that we do, as women, have adequate breast support when we are**

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**exercising because the breasts don't just move up and down and it's not just women who have larger cup sizes, it's all breasts moving in some way, shape or form.**

(TC: 00:07:55)

Dr Jenny Burbage: Absolutely, and you're right to highlight that. Sometimes the impression is maybe that you have to be of a certain size in order to have the need to wear a sports bra. However, we've not found that to be the case in our research. We've found that wearing a highly supportive bra product can really reduce breast discomfort and breast movement, right from an A cup onwards. So, we are seeing significant improvements in that comfort and support in all sizes. And unfortunately, especially for women who may be just doing the odd bit of exercise for example, and they want something that looks good, they're going to the gym and that's great. But we have to think about, from a health perspective as well, what it might mean not being supported. And the breast itself has very limited internal support structures. It's a very unique tissue, it's a soft tissue and we've found that without having appropriate breast support, it can lead to breast pain. But it can also be a barrier to exercise. So, this stops women from exercising more, which is so crucial that we do all exercise more. And if we can find a good supporting bra that you're happy with, that might help more women to exercise. But it also might lead to damage as well, to the skin, which is one of the main supporting structures of the breast. By that I mean that we've seen some evidence that with excessive breast movement, it can lead to stretching of that skin over the point where we would expect it to be, and therefore that leads to a little bit of damage to that skin, which is proposed to lead to potentially breast sagging earlier than it would do anyway.

With age, unfortunately, women's breast and the skin over the breast (TC 00:10:00) will deteriorate and the elasticity properties change, so we will end up, unfortunately, sagging anyway. However, by repeatedly not having a good breast support might lead to that process being earlier.

(TC: 00:10:16)

**Dr Hazel Wallace: Absolutely. And breast pain and the barriers to exercise are obviously really important factors. But can poor breast support also impede performance, more-so looking at athletes and things like that?**

(TC: 00:10:31)

Dr Jenny Burbage: Yes, definitely. There have been some really interesting preliminary studies showing that poor breast support can lead to changes which are both biomechanical and physiological. So, what I mean by that as some examples is that we've seen that poor breast support can lead to an increase in the amount of muscle activity, for example, that's happening in the upper body. We've also seen it lead to a shorter stride length. So, if you imagine, if someone is wearing a really poorly supporting bra, then they might not be striding out as far as they could do if they were confident and well supported. So, if you extrapolate that over a longer distance, say five kilometres for example, or longer, then that might then start affecting the performance in terms of their speed and the time it takes them to undertake that distance. And we've even seen changes to breathing frequency, for example. So, we think that due to the discomfort of having breasts

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that are moving too much, we see this breath holding technique. So, women holding their breath a bit more because it is uncomfortable. Then from a physiological impact, and this is right from-, there's some evidence to suggest that breast support and breast health issues are affecting both recreational but also elite athletes as well, and they're suggesting that there might be some changes to their performance by not having an appropriate bra.

(TC: 00:12:07)

**Dr Hazel Wallace: Yes. And it makes sense based on the factors that you mentioned, increased muscle activation because you're going to go into a protective mechanism, whether you're thinking about it consciously or not, and I think we can all relate to that ourselves, when we're out running or doing different forms of exercise. And so, for recreational athletes, or for anyone really, when you go out shopping for sports bras, typically, they're labelled high, medium and low impact, based on what activity you're doing. But how scientifically informed are those labels and are all sports bras rigorously tested before they're categorised into those labels, or is it just based on the brands' interpretation?**

(TC: 00:12:54)

Dr Jenny Burbage: Yes, that's a really good question. Unfortunately, any bra on the market can be labelled as a sports bra. There's no current regulation, I suppose, or a particular stamp or approval that a bra would need to reach in order to be termed a sports bra. So, that in itself can lead to issues, because you can get all parts of the sports bra market there advertising products, and even with the high, medium and low impact labels, they don't have to go through any kind of independent review. So, you see companies that do testing in house and they will make that decision in terms of high, medium and low. We actually run an independent test house, effectively, at the University of Portsmouth, where we do work with many major apparel companies and test their products and by doing that, we've built up a large database and a lot of information about different products. And therefore, we feel that we can give some quite independent, good advice, I suppose, in terms of what we consider to be low, high or medium when you look across the bras as a whole. However, as I say, that's not something companies have to do. So, I think if you're out and you're shopping for bras, just have a read through the information, have they been tested either in house or by an independent body? And try and pick through that information. Really, I think it's quite an individual thing, and whether you're doing a high, low or medium activity, you really need to get that bra and look at it in terms of is it appropriate for the activity that you're doing? And hopefully do a little bit of jumping round in the changing room before you decide to buy it.

(TC: 00:14:51)

**Dr Hazel Wallace: Yes. Absolutely. I think that's mind-blowing. I never really considered that, that there's no real definition for sports bra and so any bra that goes on the market could technically label itself a sports bra, which opens itself up to a whole load of problems.**

(TC: 00:15:09)

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Dr Jenny Burbage: It does, unfortunately. I mean, I think as a research group, this is something that we want to be able to tackle in the future because we feel quite strongly that there should be some kind of kite mark or something that the product has to go through in order to gain that term. Because we just think it can be quite misleading for consumers, not understanding, necessarily, the quality of that product.

(TC: 00:15:35)

**Dr Hazel Wallace: Yes, absolutely. And so, can we do a walk through, step-by-step guide to finding the right sports bra? Apart from considering the different levels of impact, what else should we be considering? The material or the strap placement, the under band, what are some headline things to run through in your head?**

(TC: 00:15:57)

Dr Jenny Burbage: Yes, so from a headline perspective, I think the two key things to consider at the outset are the size of the breast and what mode of activity that you're looking for this bra to support you doing. So, size and type of activity are the biggest factors in terms of which sports bra's going to be the most appropriate. We find that as breast size increases, you do need an increased level of support and potentially a different type of support. So, I mentioned earlier about having these three main types of sports bras as such, and we have compression sports bras, which are like the crop tops style, which are quite often sized as small, medium and large and compress the breasts. They're good for smaller breasted women, however as size increases, we find them becoming less effective. And then you might want to consider more of an encapsulation style, which is more like an every day bra, with added features. So, it supports each of the breasts individually within each of the cups, and then it generally has wider shoulder straps, padding and more support. And then you can get combination sports bras, which effectively combine a couple of those elements. And it does depend on what kind of activity you're doing and the size of your breasts as to which sports bra might be more appropriate for you. So, I think, do try it on before buying if you can, or if you're buying online, do this at home and send back if it's not appropriate. But we know that, for example, just doing five jumping jacks, so little star jumps in the changing room, that really gives a good indication of, can it deal with a really high demanding activity where we see a lot of breast movement.

So, if you're doing something quite high impact, like running for example, then by doing these jumps in the changing room, looking in the mirror, see whether you're comfortable with the level of movement that you can see and feel.

(TC: 00:18:02)

**Dr Hazel Wallace: Yes. When you mention smaller breasted women, in terms of cup size, would it be A to C for the more compression types of bras and then encapsulation D and above?**

(TC: 00:18:15)

Dr Jenny Burbage: Yes, I think generally that's where we would place that line, I guess. It's difficult because that's only taking into account cup size and not band size. And obviously, they're interrelated. But as a baseline, we would say the compression sports bras are more suited for the A and B cups, and maybe some

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C cups as well. But then if you start going above that, that's where you need to see a bit more adjust-ability, maybe different types of material, different styles. And there are lots of options out there and that's good because everyone's got their own preferences. I would really say look out for ideally having adjust-ability in that bra. So, shoulder straps in particular. Because if you think about it, we might have a woman who's five foot tall and a woman who's six foot three and they might be the same breast volume. So, looking at buying the same bra. And if you think about the shoulder straps, if you didn't have adjust-ability, how much more tension there would be for the taller woman compared to the shorter woman for example. So, having that adjust-ability to be able to make sure that you've got straps there that are firm and making sure that the under band fits well, for example. Fit is a real key thing here, we can't get away from that when we're talking about a guide to finding the right sports bra. It really needs to fit.

**(TC: 00:19:41)**

**Dr Hazel Wallace: Yes, absolutely. And actually, before our conversation, I went through, I've got quite a collection of sports bras, but just going through which ones do have adjustable straps, and even an under band that's not completely constricting and there is some flexibility in it. And (TC 00:20:00) it was interesting to see that some really great brands that I rate don't meet that criteria. And it's almost the ones that are, like I mentioned earlier, less fashionable that seem to be the best in terms of the greatest amount of support. The ones that I would pick up when I'm going for a run, for example. And so, yes, it definitely is interesting that a lot of these factors aren't always considered when it comes to making a good sports bra that you'd find on the high street.**

**(TC: 00:20:33)**

**Dr Jenny Burbage: Yes, and it's such a trade off, you mention there, between what the bra looks like, how much it supports, how much it costs, for example, and it's very difficult to get a bra that ticks all of those boxes. So, I think we do need to make a decision as to what is most important, I suppose, and what we value the most. And if you're really looking to get a highly supportive sports bra for a high impact activity, then look for bras, for example, that have a higher neckline, because we know that a higher neckline can help to reduce the amount that the breasts move up and down. So, that's really important. We also, actually, some recent research has shown that having even just some light padding in the bra can be helpful and can help to improve support. The shoulder straps definitely, I say adjustable but also wider and having some padding as well can really help in terms of comfort and support. So, there are some good products out there, but unfortunately there are so many of them that you do need to have some idea as to what might work.**

**(TC: 00:21:49)**

**Dr Hazel Wallace: Yes, absolutely, and then also just thinking about pregnancy and breastfeeding. Because I know that I've been approached by quite a few women who are either pregnant or breastfeeding and they're asking about the best sports bras for them. But I don't think there's any research into sports bras specifically looking at pregnant or breastfeeding women, is there?**

**(TC: 00:22:12)**

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Dr Jenny Burbage: No, unfortunately from looking at specific bras for pregnancy and looking at how effective they are and what kind of styles work, that research just hasn't been done on those pregnant women. And I think that's not very far away, but I imagine it's been due to some of the ethical issues around asking pregnant women to come into laboratories and to run on treadmills for example, and to do that kind of rigorous testing. Generally, when we do our testing, we have to exclude anyone who's pregnant or who has been pregnant in the last year, or is currently breastfeeding, for example. So, this is very much a niche area, which I think is definitely needed. But there also needs to be some funding there as well to be able to undertake that research. I'm currently pregnant and it is a struggle to find bras for ever changing size of breasts and then when you're breastfeeding and nursing and you want to still exercise, it's about finding products that allow you to have that ability to take the shoulder strap off, for example, and be able to still feed in that product. And I think more companies are getting interested in this and I think I have seen products out there, but we just don't have that scientific research yet.

(TC: 00:23:33)

**Dr Hazel Wallace: Yes, absolutely. And I think going back to what we mentioned in the beginning, that having the right sports bra is also important from a barrier to exercise point of view, and so it's important that women are still active in pregnancy and afterwards and so thinking from a public health point of view, it's really important that we hopefully get funding for that. But I do understand, obviously, from an ethical point of view, so I'm sure ethics would be a nightmare for this type of study.**

(TC: 00:24:08)

Dr Jenny Burbage: Yes, it's not the easiest unfortunately. I don't think it's impossible though and I think it might be helped that more recently there's been guidance, renewed guidance, coming out nationally in terms of exercising for pregnancy and the benefits related to that. And there are research groups specifically looking at the wider area of women exercising during pregnancy, which is fantastic. So, I feel like this is going to be a natural step on and we will get more information over coming years as to potential products for this niche market, it's just yes, we're a bit lagging I think in there at the minute, which is a shame.

(TC: 00:24:49)

**Dr Hazel Wallace: Yes. And then, looking at younger age groups like teenage girls and school age girls I know that there's a drive in education towards breast health there and a lot of the work that you guys are doing, but what is the current level of knowledge or current practice amongst girls when it comes to wearing sports bras in school and PE and things like that?**

(TC: 00:25:14)

Dr Jenny Burbage: Yes, I mean, we've done some really interesting research over the past few years specifically looking at this eleven to eighteen year old school girls bracket and we actually found, from a breast education perspective that that was quite poor and we had over 2,000 school girls initially part of our research and 87% of them wanted to know more about breast health and breast education. And many of them didn't own a sports bra. We saw over half of them seeing the breast as a barrier to them taking part in PE lessons. So, whether that was embarrassment or not being able to find a right bra, or yes, it's quite an

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important age and important area because obviously you have girls who are developing at different rates throughout that eleven to eighteen bracket and we really feel that there should be compulsory education on breast health at a national level. And we have developed some resources which are freely available for schools to download, which includes a lesson plan and lots of background information for them to share with the school girls. And I think the next step for us now is to see whether we can almost go to government and start lobbying for this to see whether we can get breast health and breast health education onto the school curriculum as more of a compulsory part. Because we found some real benefits by implementing some smaller breast education projects at schools. We have seen knowledge increase following that, so we feel like it's effective, so it's just about rolling this out on the larger scale now.

**(TC: 00:27:04)**

**Dr Hazel Wallace: Yes, absolutely. I mean, thinking back to my own school days and PE, I don't even remember having a sports bra, and I used to play hockey, so I'm shocked hearing the statistics, but then when you reflect on that age group, it's not really something that's in the forefront of your mind. And again, thinking back as to is it important, the education side of things, even in sexual health classes you would completely ignore the breast and breast health. Yes, it's good to know that that work is being done and those resources are available.**

**(TC: 00:27:42)**

Dr Jenny Burbage: Yes, I think we really need to target this age to bring in that education, because I think that can really set these girls up for life really. Especially because we see so many girls dropping out of sport at school age. That sort of, sixteen to eighteen bracket that move away from sport and exercise and anything that we can do to reduce barriers for them to take part I think is really positive. And it is good to see that there is research going into this and, I think, some evidence coming out which will hopefully start to initiate change.

**(TC: 00:28:19)**

**Dr Hazel Wallace: Yes, absolutely. And so just wrapping up the podcast. If people want to do further reading, whether it's finding these resources for school age girls but also beyond that, are there any public resources that people can read up a bit more?**

**(TC: 00:28:37)**

Dr Jenny Burbage: Yes, so we have a website for the University, so if you just search for the University of Portsmouth and breast health, you'll come to our page where we do have the link to the treasure your chest resources, which are for the school education project. But there's also some resources on there for bra fitting as well. So, to look at a simple guide to bra fit, we've got a video and a leaflet and things like that. So, I think if you want to start looking at some more information, that's a good place to start. But yes, there's certainly more scientific evidence coming out worldwide, which is fantastic. So, there should be a lot more information freely available for anybody to look at if they want to search.

**(TC: 00:29:24)**

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**Dr Hazel Wallace: Amazing. And then is it treasure your chest you guys also contribute to that?**

(TC: 00:29:30)

Dr Jenny Burbage: Yes, yes, that's the treasureyourchest.org, so that's where the resources can be downloaded specifically from the school girls project.

(TC: 00:29:39)

**Dr Hazel Wallace: Amazing. Well, hopefully this podcast will shed some more light and some education on breast health and maybe there are some people listening who are keen to get into that area of research as well, which we definitely need more of.**

(TC: 00:29:53)

Dr Jenny Burbage: Definitely, oh gosh yes. Please come forward. So, if you're interested in researching this area, then there's plenty still to be done.

(TC: 00:30:03)

**Dr Hazel Wallace: Thank you so much. That was Jenny giving us the low-down on breast health in sport and exercise, specifically talking more about breast support and sports bras and hopefully you've come away with this thinking a little bit differently. I know I have. And I know I've picked up lots of tips. That's all from me guys, I'll see you again next week.**

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