Perceptions and Views of the Elderly on Dirt as Vaccine for Children in Rural Areas During Pandemics: Insights From Dara Community, Gutu District

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Abstract
Dirt cultural rituals have been associated with innumerable positive health outcomes for children including the justification for acts of rubbing or placing clay soil on the tongue and prescription of urine when the child is about to grow his/her first teeth. Understanding the mystery and potential medicinal effects of soil-based microbes on children's immunity is a central health question. It is on this basis that the present research examined the intricate symbiotic relationship that reigns between dirt and immune tolerance. Anchored on a phenomenological case study design, this study interviewed seven participants who were purposively sampled. Thematic analysis was used to analyse the data. The study revealed that: 1). Taking small doses of bacteria or poison either intentionally or unintentionally usually makes one resistant to various disease outbreaks. 2). Children living in urban areas are more susceptible to outbreaks. 3). Local soils contain some medicinal nutrients which minimise the chances of children contracting various types of diseases. The researchers recommended that children should be allowed to freely interact with other children who are not necessarily part of their households and be allowed to play with soil and other various natural components. Children should also be aroused early and allowed to play in the sunshine to develop strong bones and a strong immune system. In addition, parents should follow indigenous and cultural ways of raising their children such as giving them traditional medicines, but more importantly, ensuring that children are vaccinated in health institutions to protect them from various diseases. Traditional medicines are never a substitute for vaccinations, but the two should complement each other.

Keywords: perception, vaccines**,** dirt, immune tolerance, soil-based microbes.

Introduction
The mention of the term 'dirt' has been habitually viewed as absurd, disgraceful and in great disfavour and, at some point, sharply demonised as detrimental to human well-being (Fix et al., 2020). But, what if dirt is an unclear culprit that conveys some form of hybridised immunity to

those exposed to it at the most opportune stage in their lives? The connotations proposed in this view must be meticulously investigated in the realm of both tangible and intangible dirt as an immune fortifier and possibly as a vaccine (Greenwood et al., 2012). It is therefore of paramount importance to understand the meaning of dirt in the framework of this paper. Ideally, the human body's somatic cells are wrinkled with enzymes, collagen, hydroxyapatite, and glycoprotein molecules along their extracellular matrix or surface membrane which function with specificity in the human body (Ruddock & Molinari, 2006). Glycoproteins serve as cell identification markers where they act in cell-to-cell recognition. For instance, they can distinguish a skin cell from a red blood cell, a hair cell from a white blood cell, hence they can detect cells that are foreign to the body (Bian et al., 2022). In this vein, glycoproteins can be classified as immunologic molecules, that is, immunoglobulins and histocompatibility antigens as they can recognise all external substances that enter the body and prompt an immune response to fight off the infection (Robert et al., 2006). To this end, it seems safe to plausibly argue that the body regards foreign substances such as dirt, poisons, mycotoxins and so on as invaders and harmful hence the immune response is an attempt to detoxify.

Upon reflection, however, not all foreign substances are essentially foreign to everyone (Beetz et al., 2018). In a classic example of differences in immune tolerance between children domiciled in a squeaky-clean environment and those in the dusty and unhygienic rural environment, and wearing dirty clothes, the later were seen to resist several diseases (Karimi et al., 2022). To this end, a candid observer might be perplexed by the distinction between rural children who do not fall sick from such exposures to dirt, whereas a person coming from a hygienic home almost gets life-threatening immune responses and diarrhoeas if they get exposed to the same environment (Mosenthal & Martin, 2021). According to Stefanovic et al. (2020) all this boils down to three basic factors, which are individual immune tolerance, the extent of foreign substances to the individual as well as the dose.

To put this into context, families that are deep-rooted in cultural beliefs ordinarily bath their infants in water that is mixed with dirt, not just any dirt but the dirt that has been collected from public spaces such as marketplaces, bus terminus or rank (Alebila, 2019). Of note, emphasis is put on the location of this dirt, because dirt that is found in public spaces contains more bacteria and other foreign substances than dirt collected from a secluded space (Blaustein et al., 2019). The rationale

behind bathing infants in dirt-infested water is to achieve early exposure to foreign substances to children so that they develop a tolerance against foreign substances at a young age and hence they cannot get sick when exposed to the same pathogens later in life (Bee et al., 2018). On one more practical level, children at the "oral stage" barely close their mouth and are very curious, touching and putting every dirty object they can grab in their mouth, from shoes to keys, licking rocks, eating mud and so forth (Sully, 2020). This helps them introduce soil-based microbes (sometimes called soil based organisms) in their body and allow their immune system to register the existence of such pathogens (Brevik et al., 2020). Children develop a higher level of tolerance for the bacteria such that the normal dose would not get them sick and thus conditioning their immune response to ignore fighting some foreign substances which are not harmful and just excrete them without triggering an attack (Marrs & Sim, 2018).

Freedman et al. (2021) opines that most bacteria pathogenic, with only about 1 percent of the different types of bacteria known to man able to make humans sick in their sufficient numbers since different numbers of bacteria are necessary for a reliable infection depending on their species. For instance, the infectious dose or amount of *Escherichia coli* 0157:H7 bacteria that can make one sick is about 100 cells whereas the infectious does of Salmonella typhi is 10 000 cells (MSDS Online) (Liu et al., 2020). This follows a principle explained by dose response curves that different substances have different lethal doses (Zhong, 2021). The toxins produced by each of these bacteria have different potency and hence some bacteria are more potent even in fewer numbers than others.

Since most bacteria is not harmful but helpful in our bodies, you will find that our microbiota is quite populous, with over a thousand species of bacteria occupying the gut in their trillions (Gupta, 2021). In fact, there are ten times more microbial cells than human cells in one's body and there are more bacteria in your mouth than the entire human population (Ogden et al., 2021). Most bacteria are helpful, for example, gut flora such as *Lactobacillus bulgaricus* assists in the digestion of proteins, some even destroy disease-causing cells and provide vitamins for the body (Gao et al., 2019). To understand how these bacteria manage to occupy the human body and not get attacked by the white blood cells, it is important to note that these bacteria appear to the body's immune system as if they are cells of the digestive system and not foreign invaders (Kashimura, 2020). This is because the bacteria cover themselves with glycoprotein molecules removed from actual

cells of the digestive system (Lee et al., 2021). Since glycoproteins are cell identification markers as discussed earlier in this paper, the bacteria are thus disguised and protected from the immune system.

To further understand this principle, reference is made to the Ebers papyrus history about the uses of toxic agents documented around 1500 BCE. Ideally, it is one of the medicinal documents conserved relics and it articulates the utility of various forms of poisons for instance hemlock, aconite arrow poison, opium, lead and copper (Still et al., 2020). Around 399 BCE, passing on by hemlock poisoning was a deep-rooted means of capital penalty in Greece, most conspicuously in the enforced felo-de-se of Socrates (Klaasen, 2008). Hippocrates discoursed bioavailability and over dosage of contaminated agents and planned poisonings used mostly by aristocratic women as a way of eliminating unwanted spouses, a common occurrence in Rome (Naaz et al., 2019). By about 350 BCE, Theophrastus, a protege of Aristotle, made numerous references to poisonous plants in his initial De Historia Plantarum. Around 75 BCE, King Mithridates VI of Pontus (modern Turkey) became fixated with toxins and, from an infantile age, took insignificant quantities of as many as 50 poisons in the expectations of generating resistance to each of them (Velmet, 2020). This practice encouraged substantial conditioning to poisons and the standard poisonous mixture were no longer effective in attempts to kill him by poisoning. The term "mithridatic" comes from the name of this king and it refers to an immunity against the action of a poison produced by minor and progressively snowballing dosages of the poison (Roller, 2020).

Statement of the problem

A bacteria called *Mycobacterium vaccae* exists in soil and helps strengthen the immune system (Brevik et al., 2020). Because this bacterium is everywhere where there is soil, it is hard to avoid and let children play with dirt as it conditions their immune system to understand which foreign substances are best left "ignored" as not all foreign substances are dangerous or fatal (Kuhl et al., 2021). Why is lack of exposure to dirt ordinarily trigger violent immune responses on people who stay in overly sanitised environments.?

Objectives of the study

The objectives of the study were to:

i) Examine the perceptions and views harboured by the elderly on how the immune system is conditioned to bacteria.

ii) To establish traditional systems used to make rural children resist dirt-related diseases.

iii) To examine the utility of dirt on human welfare in the Covid-19 pandemic.

Materials and methods

Research approach

The research was anchored on a qualitative paradigm which ensured the harnessing of the subjective, often impalpable nature of human organisms. This approach was suitable for the study because it revealed the mysteries behind the survival of rural children during pandemics. Mataruse et al. (2022) opine that a qualitative study is a methodology employed by researchers whose conviction demonstrates that any phenomenon is better understood when interrogated as it happened in the context of participants. The study sought to unpack a very crucial and often concealed symbiotic relationship between bacteria and human immunity. Hence, the qualitative methodology was appropriate to explore the intricate qualities related to the phenomenon in question.

Design

Research design refers to the structural plan of the research that is employed to elicit data that speaks to study objectives (Schumacher, 2022). The study utilised a qualitative phenomenological case study in an endeavour to comprehend the perceptions and views of the elderly on medicinal effect in microbes. Al-Ababneh (2020) postulates that one of the pros of a case study strategy is that, ordinarily, it helps the scholars to gain insight of concealed phenomena from respondents' worldview. Therefore, this research design promoted the understanding of dirt as a vaccine from the viewpoint of elderly people in rural areas who have been practising bacterial rituals in boosting children's immunity.

Population

The target population of this research was people with an age range of 60 -100 years domiciled in Dara village, Gutu North, Masvingo, Zimbabwe

Sample and sampling techniques

Mataruse et al. (2022) posit that establishing a suitable sample size in qualitative study is entirely the discretion of the researcher's discernment and experience in assessing the value of the data elicited in relation to the facts under consideration. In view of this, the sample size of this research was determined by data saturation. Purposive sampling technique was used to recruit this study's

participants. The study sample had seven (7) participants comprising three (3) males and two (4) females.

Data collection procedure

The researchers sought permission to engage the respondents from the civic leaders. Informed consent was sought from participants. One-on-one in-depth interviews were employed to elicit data from the participants. In-depth interviewing is delineated as a qualitative research strategy that entails the administration of comprehensive individual consultations with a slight number of participants to gain an understanding of a specific phenomenon (Mataruse, 2021). In a similar vein, Brevik (2019) notes that in-depth interviews help in gaining quality information about the respondent's worldview. Interviews were favoured because they are flexible, hence researchers had the latitude to probe for more information. Interviews spanned for roughly an hour or less depending on the expressiveness of the respondents. The interviews were done in participants' mother language, Shona, considering the literacy level of the participants. With participants' consent, interview responses were audio-recorded to prevent loss of important information.,. The interview recordings were transcribed in Shona language and the transcriptions were then transliterated to English.

Data analysis

Data were analysed using thematic analysis technique. Notably, thematic analysis is an algorithm employed to sift data which encompasses skimming through a set of information to establish and evaluate frequent patterns (Matewe et al., 2022). The thematic analysis was used in synthesising data and constructing themes for the research.

Results and discussion

The study revealed that the immune system is heavily conditioned to bacteria. All respondents indicated that bacteria that get into human bodies, especially in small doses, help in conditioning the human body's immune system. People who are unintentionally or intentionally exposed to bacteria have a stronger immune system than those who stay or grow up in total bacteria-free free environments. Adolescents reported psychosomatic disturbances and phobia-related symptoms. Some participants complained of experiencing unexplained physical pain post cyclone Idai disaster. Participants also grappled with rainfall-related phobia. The following quotations are illustrative:

> 'Following the Cyclone Idai and its related impact, I had to be admitted at a hospital for some days as I felt pain all over my body'. (P13)

> 'Because of the losses we experienced, the sight of building clouds makes me shiver. Even up to now, when it starts raining I am not comfortable as I dread the experience of rainfall given the past experiences'. (P6)

> 'Children who grow up taking small doses of bacteria or poison either intentionally or unintentionally are usually resistant to various disease outbreaks such as Covid19, cholera, and others.' Participant 2

> 'Many people in urban areas or living in urban set-up standards who were never exposed to difficult living conditions were the main victims of Covid-19 and cholera outbreaks. Rural children were not affected because of a strong immune system which was conditioned by staying in dirty areas.'

The results show that not all bacteria are harmful to the body since some help improve or harden the body's immune system. The findings are consistent with Gupta (2021) who argued that most bacteria are not detrimental but essentially helpful in human bodies, because the human microbiota is relatively populous, with over a thousand types of bacteria inhabiting in the gut in their trillions.

The study established that children who grow up in rural areas and children in urban areas are exposed to various forms of dirt. The study revealed that the setup in rural areas in Masvingo allows children to do a lot of outdoor activities such as playing traditional games such as *pada*, and soccer outside the houses. In the process, they eat soil and other herbs that are medicinal, which, in turn, harden their immune system. There is a strong cultural belief that local soils contain some medicinal nutrients which minimize the chances of children contracting various types of diseases such as bilharzia, Covid-19, cholera and others. One of the respondents remarked**:**

> We let our children play outside and we have no problems with their health *tsvina hayiurayi* we were raised by farmers we were never sick only the born-born people are always going to the clinic."

Another participant remarked:

> No! our children never suffer from diarrhoea but some adults who move in from new places always need treatment and boil water or use table (I think they mean chlorine tablets) Children who grew up here are never sick but those who settle in from other places struggle with diarrhoea.

A study by Beetz et al. (2018) established that not all foreign substances are fundamentally foreign to every person. Furthermore, Karimi et al. (2022) argues that the differences in immune tolerance between persons domiciled in a clean setting versus the dirty and insanitary environment is that, those who live in dirty places are more resistant to diseases than those who live in clean environments. For example, rural children across the global south live in very dirty places, put on the same dirty clothes for prolonged periods while feeding from dirt but they still survive the outbreaks of pandemics such as Covid-19. It is perplexing to note that rural children do not easily fall sick from such exposures to dirt, whereas a person coming from a hygienic home almost gets life-threatening various outbreaks such as cholera, Covid1-9 if they get exposed to similar situations. Stefanovic et al. (2020) summarise the issue by arguing that all this boils down to three rudimentary aspects, which are individual immune tolerance, extent of foreign substances to each individual as well as doses.

The study further revealed that families that are entrenched in social and cultural beliefs carry out some traditional activities which they believe strengthen children's immune systems such as bathing babies in water mixed with some doses of dirt that is collected from the local area. Some families rub-clay soil on children's tongues while others make them concoctions such as traditional medicines. Consistent with this view respondent 3 had this to say;

> We rub clay soil on their tongue or put it under the tongue. We also tie a wool string on their waist and *kuvamwisa* their urine if they have a fever/high body temperature. Our first-born children are raised by our mothers after we wean them because our mothers know all the tricks.'

The other participant also remarked:

> 'At 2 months old we start rubbing or place clay soil on the tongue, we administer urine when the child is about to grow his/her first teeth, the wool string is placed 3 weeks after birth (Munyas comment: I think this string harbours bacteria because I once saw a kid *anayo* and it was dirty *haibviswi* so I think the string is just a reservoir for bacteria and since its always on his body the bacteria spreads).'

Participant 7:

> We didn't do anything cultural on our children except praying for them at church, it varies but the child is prayed for, then bathed in water containing sand before his belly button dries because that is the instruction we are told by the elders/ *vakuru*.'

The results are consistent with Alebila (2019) who argued that families bathe infants in water that is mixed with dirt, not just any dirt but dirt that has been collected from public spaces such as marketplace, bus terminus or rank. The elderly argues that dirt that is found in local public places comprise more bacteria and other foreign substances than dirt collected from a secluded space which in turn harden or improve their immune system. The justification for bathing new-borns in dirt-infested water is to realize primary acquaintance to foreign substances to babies so that they develop a resistance to diseases and tolerance to foreign substances at a tender age. This helps them in that if they get exposed to the same pathogens later in life their bodies can resist them, which consequently protects them from various forms of illnesses. One of the participants remarked:

> Children usually put every dirty object they get such as cow-dung, shoes, licking keys, rugs, sticks and soil in their mouth. Children also play in dirt bacteria-infested water such as pool water.'

The dirt objects contain both bacteria and medicinal elements such as soil-based microbes. The soil-based microbes make children's immune systems register the presence of such pathogens.

It was also established that most people believe that the vaccinations that are given in hospitals should not be viewed as the primary source of boosting children's immune systems but a complimentary to the natural traditional way of hardening the child's immune system. The study revealed that children become conditioned to bacteria not because they are vaccinated but because they have grown up in their natural environment and exposed to various dangers in life. One respondent remarked:

> The child is not vaccinated at the hospital because our religion is enough. We give the child "*midzi*" if it gets serious.

Another respondent:

> 'Our children do not need to go to the hospital and they are never bedridden with any illnesses.

The study also revealed that this category of people strongly feels that their children do not fall victim to local and prevalent bacterial disease outbreaks like cholera. Participant 3 said:

> 'They grow up strong and clever (Munyas comment: I think when she said clever she meant *vanokura* vari active *vasingatyi kurwara netsvina* since *mabasa anowanikwa mu*

demographic region *mavo*, i.e., at the fields *achida vanhu vanomhanya mhanya vachipinda pese* without *kusema tsvina*)

Conclusion

The study revealed that initiating children to take small doses of dirt which usual contains some bacteria or poison either intentionally or unintentionally usually makes them resistant to various disease outbreaks during pandemics. Although vaccination of children is mandatory at birth, children living in urban set-up standards are more susceptible to outbreaks than their counterparts in rural areas. There is a long-standing cultural belief that local soils contain some medicinal nutrients which minimalize the chances of children contracting various types of diseases such as bilharzia, Covid-19, cholera and others. It was also noted that not all bacteria are harmful to the body since some help improve or harden the body's immune system. In that view, the soil-based microbes make children's immune systems register the presence of such pathogens.

Recommendations

The following recommendations were made;

- It was recommended that children should be allowed to engage in outdoor play with other children and allow them to play with various natural components such as the soil and let them work up early and play in the sunshine. Such activities will make them develop strong bones and a strong immune system.
- Traditional medicines are never a substitute for vaccinations but the two should complement each other.

Future studies

Future studies should focus on street children who migrated from rural areas and settled in urban centres. Most street children eat dirt or stale food but they survive various dirt-propelled diseases. There are a number of street children who survived various types of pandemics such as cholera, COVID-19. It is unclear whether the type of dirt exposed to street children also make them resist several hygiene related diseases.

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