Does fraternity have scientific roots?
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The current medical scenario is characterised by rapid technological advances and by evidence-based medicine. Efficacy must be proven by randomised controlled trials performed on large cohorts of patients and costs must be contained to ensure acceptable value for money.

Is there any place for the fraternal dimension that binds humankind together?

Is there any scientific evidence for this dimension in the field of medicine?

Perhaps the answer depends on how we approach the literature. What is our focus of interest with respect to the huge number of studies being continuously published?

Particularly in recent years, our attention is being directed towards aspects that are not strictly technical. How do we relate and communicate with the patient? How does the individual subjective response to therapy compare with the anonymous results of large cohort studies? Is the spiritual dimension important? What further benefits could be gained by the “therapeutic climate” within the healthcare team and by lifestyle modifications? Could the community and society as a whole improve health?

It is therefore clear that values related to fraternity emerge as we seek to find answers to these questions. Even the coldest scientific experimentation in the medical field must contend with the warmth of fraternal bonds among human persons.

In fact, if we examine the purely biologic aspects, we find that increasing attention is being given to on new models of intelligence, such as the so-called\(^1\) “emotional-social intelligence”. Up to now, only the logical-mathematical intelligence, as measured by the traditional IQ, had been considered. This was believed to be of genetic origin and hence non-modifiable by experience. Studies are now showing that the capabilities of social intelligence are strongly influenced by interpersonal relationships, and can be learned and improved during one’s lifetime. These capabilities include empathy (the capacity to recognize other people’s emotions and feelings, to understand their point of view, their interests and internal difficulties) and attention (the capacity to listen actively, allowing true inter-personal dialogue). Other elements of social intelligence include self-awareness, situational awareness and concern for others. Functional neuro-imaging of the brain is building up a sort of map of our “social brain” by revealing the neuronal networks that are activated during inter-personal interactions. Every interaction appears to create a functional bond, a sort of reciprocal adaptation between the brains which connect and influence each other.

It has also been shown that emotions are contagious. Positive feelings appear to spread more quickly than negative ones and have been found to increase loyalty and cooperation among individuals.

The principle of reciprocity, that is, treating the other person as we wish to be treated ourselves, also has a scientific basis in neuro-physiologic processes. This interdependent synchronisation of feelings, thoughts and actions that characterises the relationships between persons, seems to be the work of a specific class of neurons termed the “mirror neurons”. These neurons are selectively activated when performing an action, as well as when observing the action being performed by someone else. The observer’s neurons are hence “reflecting” what is happening in the brain of the person under observation, as though the action is being performed by the observer.

Findings such as these, from the field of the neurosciences, show that the reciprocity that binds us to others is a pre-verbal and pre-relational condition that human beings naturally have. The human being has an innate need to interact and initiate relationships with other fellow humans.

Studies have focussed on the role that “mirror neurons” play in the solidarity we feel when we encounter pain in others. When we are faced by suffering in another person, our own brains show activation patterns that are similar to those that are found in the other person. In effect, the other person’s suffering is “reflected” in the same areas of our own brain. Hence, sharing another person’s suffering is not only the result of compassion but has also biological origins. Furthermore, it has been observed that our mere physical presence in close proximity the suffering person can greatly diminish the other person’s perception of pain and raise the pain threshold. This proximity to others is therefore fully qualified to retain its rightful place as a valuable adjunct in pain therapy.

Interpersonal relationships influence other organic systems as well. For example, significant social contacts have been found to accentuate positive emotional states and improve the functioning of the endocrine and immune systems.

Emotional support (warmth, emotional closeness, physical proximity, loving participation, high-quality interactions) reduces biologic stress by lowering blood pressure, heart rate and levels of cholesterol and noradrenaline. On the contrary, the lonelier a person feels, the weaker will the immune and cardiovascular functions be.

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2 Rizzolati G., Sinigaglia C. (2006), So quel che fai il cervello che agisce e i neuroni specchio, Raffaello Cortina Editore.
4 Gallese V., Neuroscienze e fenomenologia, Enciclopedia Treccani, Terzo Millennio, in press.
The influence of affect on outcome after acute myocardial infarction was studied in the United States. Regardless of age, severity and co-morbidities, a solitary life increased the risk of mortality by almost three times within the first 6 months.\(^8\)

The presence of family members in intensive care units has been found to benefit the cardiac function of patients. In those periods of time when family members were allowed more frequent access, the patients showed a reduction of anxiety and acute stress hormones. However, the most surprising and most clinically relevant finding was a twofold reduction in major cardiovascular complications. This was shown in a study conducted in Careggi University Hospital, Florence, Italy and published in *Circulation*, a prestigious scientific journal.\(^9\)

We can therefore state that emotional closeness and sharing are not only useful to improve the patient’s quality of life, but are biologically active adjuncts to standard medical therapies. The network of persons that surround the patient is therefore a fundamentally important therapeutic resource!

Moreover, studies on the physiological consequences of violence and hostility among ethnic groups have shown that the mere thought of the enemy induces physical responses with an increase in stress hormones and blood pressure and a decrease of immune defences. On the contrary, forgiveness acts as an antidote that inverts the said biological responses.

For example, research conducted in Northern Ireland\(^10\) on both Catholic and Protestant persons who have lost a relative during conflict between the two factions, has shown that those who were able to forgive not only felt less emotionally wounded but also demonstrated lower levels of trauma symptoms such as lack of appetite and insomnia.

Up to this point, consideration has been given largely to the biological effects of reciprocity. We now turn our attention to what has been defined as the historical core of Medicine, namely, the doctor-patient or healthcare worker-patient relationship. Even here, there exists scientific evidence of the influence that relationships have on health outcomes.

Many studies have shown the advantages that empathic relationships bring to therapeutic outcomes. Both the quality of communication as well as participation in the treatment plan, have been found to influence the patient’s health status, in terms of numerous parameters. These include: emotional state, compliance to therapy, resolution of symptoms, restoration of function,

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pain control, physiologic parameters such as blood pressure and glycaemia.\textsuperscript{11,12} There is also an important decrease of malpractice claims.\textsuperscript{13}

However, contemporary medicine extends well beyond the doctor-patient relationship to encompass the explosion of healthcare technology and the multitude of sub-specialisations. This demands a close synergy among the various healthcare workers that come into contact with any given patient. In this respect, research has demonstrated the importance of the quality the relationships between these various healthcare professionals.

Are there any differences between healthcare environments characterised by teamwork and others that do not pursue this objective? Results reveal that in the former case, healthcare workers experience a greater professional satisfaction than in the latter case. This is the result of greater collaboration, participation and perceived group cohesiveness. Levels of staff turnover are also decreased. Significant results have also been obtained in terms of patient health, such as improvement in functional status and reduction of the length of stay.\textsuperscript{14,15}

Medicine also has an important social dimension in its aim to improve the health status of entire populations, especially those who are more deprived. Medicine contributes significantly to the development and preservation of peace in society and among nations.\textsuperscript{16,17} Yet medicine is itself deeply influenced by the customs, values, economy and politics of the society in which it is practised. It is a known fact that health and well-being depend primarily on determinants that are often thought of as extraneous or non-influential, for example: culture, socio-economic status (which in turn influences behaviour and lifestyle) and the environment (understood as an ecosystem).

The direct link between income and health (the so-called social gradient) is a known fact that was established in historical research comparing under-developed countries to rich countries. Several avoidable causes of illness had emerged such as, injustice and lack of equity. What is now clear however is that, even within the individual healthcare systems of western countries, there exist significant social gradients.\textsuperscript{18}

\textsuperscript{11} Stewart MA. \textit{Effective physician-patient communication and health outcomes: a review.} CMAJ 1995; 152: 1423-1433.
\textsuperscript{15} Gelb Safran D., Miller W., Beckman H., \textit{Organizational dimensions of relationship-centered care.} J General Internal Medicine 2006; 21:1525-1497.
This leads us to the conclusion that possible solutions are to be sought in measures aiming to reduce inequity by promoting solidarity between the rich and poor, as well as among the different generations.

Several years ago, a few Norwegian politicians, when faced with the problem of how to organise their healthcare system in a more equitable way\(^{19}\), chose fraternity as core value to inspire the required reforms. To date this is the only study existing in the body of international medical literature that uses the term “fraternity”.

Social inequity is not only a negation of man’s universal value but is also a notable cause of the most important forms of morbidity existing today, over and above and independently of the specific aetiologic agents.\(^{20}\) Consequently, eliminating social inequity cannot but bring about an improvement in the health of populations and hence, a reduction in health care expenses.

To conclude, the promotion of fraternity as a fundamental value in medicine is a privileged cultural paradigm, a winning strategy to face up to the current challenges of globalisation that are involving also sphere of health.

If fraternity were to become a value, shared and pursued by everyone at all levels – in research, interpersonal relationships, services, healthcare organisations as well as political systems - what effects could we hope for?

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