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**Crying, Catharsis, and Health**

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## **Crying, catharsis, and health**

Among both scientists and the lay public, crying<sup>1</sup>, the shedding of emotional tears, is often assumed to be healthy, or at least to have a tension-reducing effect. Cornelius (1986), in his study of crying in the popular press, reviewed 72 articles on crying published in popular media between 1848 and 1985. He found that in the majority of articles crying was considered essential to human health and well-being. The advice of many of the articles, regardless of the time they were published, was not to hold back tears, as this might lead to a variety of negative consequences ranging from unhappiness to ill-health or even death.

Vingerhoets and Scheirs (2001) and Becht and Vingerhoets (in press) provide some nice illustrations how crying and its functions are perceived, extracted from poems and quotes from popular writings. To mention some examples, crying is considered as the most human and universal of all relief measures and as a vital part of a healing or growing process that should not be hindered, or as an inborn healing mechanism. One cancer patient declares that his neck tumor was caused by the inhibition of his tears. But also eminent scientists including the famous British physician Sir Henry Maudsley has been quoted, stating that "Sorrows which find no vent in tears, may soon make other organs weep".

In this chapter, we first briefly review the most important scientific theories that have been formulated about crying. We then describe the research conducted in this field and the evidence for the effects of crying on catharsis and health. Finally, we discuss the contradictory research results that have emerged from studies of the relationship between crying and physical and emotional well-being and suggest ways to reconcile some of these contradictory results.

### **Theories of crying**

Theories of crying have been formulated by people from many different backgrounds, including clinicians, social and experimental psychologists, and biochemists (Kottler & Montgomery, 2001; Vingerhoets et al., 2000). The ways in which, according to these theories, crying may contribute to physical and emotional well-being, are multiple.

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<sup>1</sup> Some authors, including one of us (RRC), prefer the term weeping.

Below, some important theories on crying are briefly reviewed. Throughout, emphasis is placed on the postulated effects of crying on health and well-being.

### Cathartic theories

Some theories propose that crying results in a form of emotional catharsis. Catharsis may be defined as the experience of relief or release of emotional tension as well as decrease in felt distress or physiological arousal. The word catharsis is derived from the Greek *katharsis*, meaning 'purification', and a related word meaning to 'cleanse and purify' in a ritual context (Cornelius, 1997). Behind the idea of catharsis lies another idea, namely that withholding crying when it is called for may result in ill-health. The emotional tension we have failed to release by crying will be discharged through other means, resulting in a variety of physical and psychological symptoms (see Groen, 1957). Headaches, ulcers, hypertension, and insomnia are some examples of disorders that, according to catharsis theories, will result from the failure to cry. The idea that crying facilitates catharsis is thus entangled with the often assumed positive effects of crying on health. Crying is commonly described as health-promoting in a cathartic way. It alleviates built-up emotional stress, whether this stress is in the form of psychological tension or in the form of toxic waste products resulting from the exposure to stressful conditions (cf. Frey et al., 1981).

An early influential theory describing crying as a cathartic process was formulated by Sigmund Freud (1915/1957). According to this author, stimulation of the lacrimal gland would relieve the brain from accumulated stress. Other psychoanalysts, such as Heilbrunn (1955), also endorsed the idea that tears are a physiological means of relieving the state of tension generated by tear-provoking stimuli. Or, as Sadoff (1966) put it, crying is a kind of 'safety valve' that allows for the 'draining off' of the energy accompanying negative affect. In this description of crying in terms of a hydraulic or overflow process, tears are considered as overflowing emotions that have reached a critical level (see also Breuer & Freud, 1895/1955; Koestler, 1964).

Bindra (1972) claimed that crying takes place when one's emotional state reaches a certain threshold value and becomes too overpowering to allow normal adaptive behavior to proceed. Tears reflect emotions that cannot otherwise be worked off in action. They are thus considered as helping to discharge tension in situations in which an individual is not able to cope effectively. Such a relationship with powerlessness has also been proposed by Crile (1915), Frijda (1986), and Vingerhoets et al. (1997).

### Reductionist theories

Reductionist theories consider crying in terms of its supposed physiological functions. According to Darwin (1872), children cry out loudly when in need of food or help and partly as a relief from suffering. The secretion of tears is a by-product of firmly contracting the muscles around the eye during the crying episode. Eventually, according to Darwin, suffering alone, through association, can cause the secretion of tears. This author further argues that crying may bring relief in much the same way as "the writhing of the whole body, the grinding of the teeth, and the uttering of piercing shrieks, all give relief under an agony of pain" (p. 175).

Montagu (1959) argued that the intense inhaling and exhaling of air during sobbing would rapidly dry out the mucous membranes of the nose and throat. He considered crying to be a protective mechanism against this drying. Tears draining through the nasolacrimal ducts would keep the membranes moist. However, since sobbing is not present in all crying episodes (see Frey et al., 1983) and no tears are secreted during running or any other physical exercise that increases breathing, it is not likely that the primary function of tears is to protect against the effects of rapid breathing. Montagu also suggested that the antibacterial enzyme lysozyme, found in lacrimal fluid, would protect against upper respiratory infections.

Frey (1985) emphasized that psychogenic lacrimation is an excretory process. He hypothesized that, like other excretory processes such as urinating, defecating, and exhaling, emotional tearing may be involved in removing waste products or toxic substances from the body. According to Frey, the reason why people feel better after crying is that their tears are removing toxic substances and stress hormones that build up during emotional stress. Frey and associates (1981) found that emotional tears indeed contain high concentrations of some hormones, including ACTH, prolactin, and endorphins, which was seen as evidence supporting Frey's theory. In addition, differences were found in the composition of emotional and irritant tears, in particular with respect to proteins. This result is, however, difficult to interpret and it is not clear whether this difference has any clinical relevance. Moreover, it is not known whether the biochemical composition of sad tears and tears of joy also differs. Critics, including Murube et al. (1999) refute this claim, stating that the amount of tears generally is so limited that it is not reasonable to presume that this process would have any physiological relevance.

### Cognitive theories

A third category of theories of crying is more cognitive in nature. Efran and Spangler (1979), for example, outlined a two-factor theory explaining crying in adults. According

to this theory, two phases occur in adult crying, emotional arousal and recovery. Crying occurs when a period of either positive or negative arousal is followed by a shift to recovery. Only during this second phase, while tension decreases, will tears flow. In this view, tears do not facilitate recovery, but are merely an epiphenomenon, marking the occurrence of important cognitive changes.

As can be concluded from the theories described above, there has been much speculation on the origin and functions of crying. In contrast, there is remarkable little theoretically guided research and systematic testing of the proposed theories and hypotheses. Until now, most research has not tested specific theories or hypotheses, but must be qualified as exploratory, descriptive and unsystematic. Writings on crying have focused primarily on descriptions of casual observations (e.g., Borgquist, 1906) or speculations about its biological origins and psychological utility (e.g., Montagu, 1959; Sadoff, 1966). However, some scientific research has been done on this topic. In what follows we will summarize the results that this research has yielded.

### **Scientific research on crying, catharsis, and health**

Experimental designs are generally considered the best for demonstrating causal associations between behavior and short-term outcome measures. The most important feature of the experimental design is randomization, the procedure of randomly assigning participants over to treatment groups. The superiority of a randomized design is based on ensuring the comparability of two (or more) groups of participants on all characteristics except the one(s) under experimental manipulation (Kasl & Jones, 2001). In this way, potential confounding factors are reduced to a minimum.

However, such a randomized experimental design cannot be used in research on crying (see also Scheirs & Sijtsma, 2001). A study participant cannot be forced to cry merely because s/he has been assigned to the 'crying' group; they can only be retrospectively assigned to a group. Participants who cried in response to an emotional, tear-eliciting stimulus will be assigned afterwards to the 'crying group', while participants who did not cry will be assigned to the 'non-crying' group. Since no randomization can take place, there is always a chance of confounding factors; for example, it is not unlikely that individuals who do and do not cry in response to an emotional film, differ in certain (personality) characteristics. Thus, since researchers will have to settle for a quasi-experimental design as the best alternative, one still has to be aware of the limitations to draw definitive conclusions. Vingerhoets and Scheirs (2001, 1998) have described how the relationship between crying and health can be investigated using other research

designs than the purely experimental one. These authors feel that quasi-experimental research can yield important information concerning the immediate effects of crying on the psychobiological and mental states of the crying individual. Moreover, the role of reactions of the social environment on these outcome variables can be evaluated.

In addition, studies can be designed in which crying proneness -- as a more or less stable personality feature -- is examined in relation to subjective and objective health status. With regard to this type of (cross-sectional) study design, however, investigators should be aware that crying proneness may be affected by health status, rather than the other way around. Examples are the increased crying proneness of depressed people or patients with certain neurological disorders (cerebrovascular diseases, multiple sclerosis, etc.; see for a review Shaibani et al., 2001). In addition, asthmatic patients may cry less often, because crying may evoke attacks. Furthermore, spurious relationships between crying and health may emerge because personality characteristics act as a so-called "third factor" being related to both crying proneness and to health status.

Studies on crying and well-being that have appeared so far can be divided into two categories based on the research designs used. One category consists of retrospective descriptions based on self-report questionnaires (e.g., Borgquist, 1906), the other consists of more systematic and controlled, sometimes even quasi-experimental studies using well-tested questionnaires and comparing as carefully as possible matched groups. Below, examples of both kinds of studies are described.

#### Retrospective descriptive self-report studies

Theories that describe crying as the cathartic relief of depressed mood and related negative emotions are largely based on anecdotal evidence from clinicians and lay persons. When people are asked to describe how they felt after a recent crying episode, many of them indicate that they felt relieved or more relaxed and report experiencing an increase in positive affect or a decrease in negative affect. In his classic study of crying, Borgquist (1906) asked a sample of university students to describe recent crying experiences and how they affected their well-being. The majority of students in his sample reported positive effects of crying. Bindra (1972) administered a short questionnaire on crying to a sample of university students, and although the questionnaire did not contain a direct question on the matter, some participants reportedly mentioned the fact that crying made them feel better. In a study by Frey and coworkers (1983), focusing on human crying frequency, 85% of the female and 73% of the male participants indicated they generally felt better after crying. Other researchers have reported similar findings (e.g., Becht & Vingerhoets, 1997; Cornelius, 1981; Lombardo et al., 1983;

Kraemer & Hastrup, 1986).

Although the results of these retrospective self-report studies thus suggest that having a good cry can make one feel better, such subjective positive effects of crying have almost never been observed in more controlled studies (see Cornelius, 1997 for an overview).

### Controlled studies

A number of controlled studies have focused on the effects of crying on mood as well as other variables, including psychophysiological functioning (see Cornelius, 1997; for a review), physical health, and coping. Laboratory studies typically use a sad film to induce crying in their participants. Before, during, and after the film, participants are asked to report on their mood and sometimes physiological assessments (e.g., heart rate, skin conductance, hormones, immune measures) are made. The data from participants who cried during the film are then compared to the data from those who did not cry. The results obtained by these studies generally fail to support the hypothesis that crying alleviates depressed mood or restores homeostasis. On the contrary, the results generally strongly suggest that crying individuals feel worse after a crying episode. Some examples of these studies are given below.

### *Crying, mood, and psychophysiological responses*

Gross and associates (1994) evaluated two conflicting views about the relationship of crying to catharsis. The first one, the recovery view, suggests that crying serves homeostasis by facilitating recovery from emotional arousal. The other, the arousal view, suggests that crying produces a state of high physiological arousal. After inducing sadness using a film, several physiological measurements were taken and emotional responses were recorded. The results indicated that participants who cried during the film experienced higher levels of sadness and emotional pain. Crying participants also showed increased somatic and autonomic nervous system activity, indicating that crying was associated with arousal and negative affect.

Similarly, Choti et al. (1987), in their examination of the social and personality correlates of crying, found that participants who cried in response to a sad film reported significant increases in sadness, frustration, depression and muscle tension, and a decrease in happiness. Similar findings of decreased happiness, increased sadness, and increased bodily tension were reported by Marston and associates (1984).

The interpretation of these findings is, however, difficult because it could of course be argued that those who fail to cry do so because they experience less sadness.

Ideally, one would like to compare study participants who appraise the experimental stimulus in exactly the same way and experience the same emotions with the same intensity, but with one group crying and the other not.

Labott et al. (1990) conducted a laboratory study on the effects of crying on mood and immunity, more specifically secretory immunoglobulin A (S-IgA), an antibody protecting against respiratory and gastrointestinal tract infections found in saliva. Overt crying turned out to be immunosuppressive; a significant decrease of S-IgA levels in saliva of criers was found when compared to non-criers. Another study of the relationship between crying and S-IgA (Martin et al., 1993) reported similar findings. Again, the occurrence of emotional tears in a laboratory setting appeared to be associated with lowered S-IgA. These data thus show that crying more likely compromises (some functions of) the immune system rather than stimulating it.

Until now, there is just one study suggesting that crying indeed may facilitate physiological recovery. Rottenberg et al. (submitted) measured respiratory sinus arrhythmia (RSA), considered to be a parasympathetic parameter related to emotion regulatory activity, in study participants exposed to a sad movie. It appeared that nondepressed crying individuals exhibited increases in RSA, whereas not crying subjects and depressed crying persons failed to show this increases in RSA. It was concluded that crying indeed may serve homeostatic functions, at least in nondepressed persons. In conclusion, the evidence supporting a positive effect of crying on mood or psychobiological functioning is to date weak at best. However, the quality of the studies and in particular also the choice of the parameters is not always optimal. This kind of research is a major challenge for the future.

### *Crying and physical health*

Some studies have investigated the relationship between crying and physical health in a more direct manner. Among the few studies the results of which suggest a positive effect of crying on health, is the study by Crepeau (1980/1981). This investigator examined crying behavior in ulcer patients, colitis patients, and healthy controls. Her results showed that both male and female patients cried less frequently in a variety of situations than did healthy controls. Patients also had a more negative attitude towards tears, regarding crying as a sign of weakness or loss of control. However, the compared groups were not matched carefully and some additional methodological problems prevented a clear and unequivocal interpretation of the results. Most problematic, however, is that the retrospective nature of this study does not exclude the possibility that the differences in crying behavior are the consequence rather than the cause of the disease. Therefore, we

badly need data from prospective studies. It would be of utmost importance if investigators would be able to include questions on crying behavior in large prospective population studies.

*Crying, coping, and subjective health and well-being*

In their study of the use of crying as a coping mechanism, Labott and Martin (1987) found that those who cry often in response to negative life events were more likely to report high levels of mood disturbance. Labott and Martin deem it possible that crying "may enhance distress, instead of releasing or reducing it" (p. 162). In a second study, these investigators found additional evidence for increased depressed mood after a crying spell induced by a sad film (Martin & Labott, 1991), as did Kraemer and Hastrup (1988).

Vingerhoets and collaborators (1993), investigating the links between self-reported crying proneness and personality, coping, and subjective health status, also failed to find support for the hypothesis that crying is healthy. In their study, self-rated health was not associated with crying, but some relationships between crying, on the one hand, and coping and personality, on the other hand, were uncovered. More specifically, negative associations were found between crying proneness and alexithymia and the coping strategy "distancing", whereas crying proneness and the coping factors self-blame, day-dreams and fantasies, and expression of emotions/seeking social support were positively associated.

A final study of interest to the current question has been conducted by Hendriks et al. (2001). This group examined the relationship between crying and subjective health status, much similar as done by Vingerhoets et al. (1993). However, in their regression analysis with crying frequency as predictor and subjective health status as dependent variable, they also introduced the short-term effect of crying (whether people felt that their well-being after a crying episode generally improved, stayed the same, or deteriorated) as an additional predictor. The results indicated that a positive subjective health status is predicted by a relatively low crying frequency. Surprisingly, the subjective short-term effects of crying failed to have any predictive power and did not show any relationship to health status.

To summarize, the hypothesis that crying generally results in some form of catharsis or positive change in health status could not be verified. Crying in response to a sad film in a controlled setting does not appear to lead to any appreciable decrease in emotional tension or distress, or to an improved psychobiological functioning. Indeed, results of various studies seem to point in the opposite direction, relating crying to

increases in arousal, tension, and negative affect. Future studies need to take into account that crying presumably is more likely when the level of distress is higher or people feel more intense emotions. In addition, it cannot be ruled out that immediately after a crying episode, the order of events suggested by William James (1884) holds, which implies that people report that they are very sad or distressed, *because* they have cried. The crucial point is that one should compare the psychological state of people who are absolutely identical in terms of quality and intensity of mood, but who just differ in crying. This will be a serious challenge for investigators.

#### Reconciling discrepant research findings

Since there is a major difference in the results of retrospective self-report studies, in which participants are asked to describe a recent crying spell and more controlled studies that mostly use sad films to induce crying, one may wonder how these differences may be explained. In the former case, people generally report positive effects or no changes in mood after crying, whereas the results of laboratory studies uniformly have yielded that mood is lowered after a crying episode. There are several possible factors that may be held responsible for this major difference in study outcomes. First of all, in the quasi-experimental studies, there may be insufficient time for crying to bring about its beneficial effects. Perhaps the cathartic effects of crying become first manifest after a longer period than is used for assessments in most controlled studies (Gross et al., 1994). Measurements are usually taken immediately after the tear-inducing stimulus has ended, after only a few minutes or, at most, within a few hours. In retrospective self-report studies, participants possibly base their reports of how they felt after crying on a longer span of time (Cornelius, in press). As far as the time span of the effects of crying is concerned, there is another additional important question. Does crying bring greater relief than the passage of time alone? Possibly, the cathartic effects of crying are due simply to the passage of time. Kraemer and Hastrup (1986) found that depressed affect diminishes in one or two hours regardless of whether people cry or inhibit crying. These issues need further investigation.

Some kind of memory bias could also contribute to the difference in results between retrospective self-report studies and controlled studies. In all self-report studies, participants chose themselves which episodes they described. Since popular accounts of crying suggest we *should* feel better after crying, respondents may simply have chosen episodes in which they indeed recalled feeling better (Cornelius, 1997). It may also be that crying episodes after which one feels good are easier or better remembered, or more readily reported, than crying episodes that leave one feeling sad.

Another aspect that needs to be considered seriously as a possible explanation for the different results of the two types of studies, concerns the difference in intensity of crying in the two kinds of settings. Most controlled studies were conducted in group sessions in a rather artificial, i.e. laboratory setting. Feelings of shame and or social reactions may prevent participants from expressing their emotions overtly during these sessions. Additionally, the kinds of stimuli used to elicit tears in the laboratory are, because of ethical considerations, often necessarily less intense than those in real-life situations. For these reasons, the intensity and duration of crying under laboratory conditions might therefore be considerably less than that under more natural conditions where crying may involve a prolonged expression of tears, vocalization, and/or respiratory changes (Martin & Labott, 1991).

Finally, Cornelius (1997) argued that "participants in laboratory studies do not feel better after crying because they have no reason to feel better" (p. 307). According to him, participants will only report emotional relief after crying in situations in which the events that caused them to cry in the first place, have been resolved or in which their crying has had some positive effect, for example on the social environment. In the laboratory, participants generally have no control over the events that cause them to cry. In real life, in contrast, crying might lead to a way of resolving the emotional situation. For instance, crying may trigger a social response of comfort or offered help (see Cornelius, 1997; Cornelius & Labott, 2001; Fischer & Manstead, 2000; for a more detailed description of the effects of crying on the social environment). Along similar lines of reasoning, Martin and Labott (1991) argued that crying may have positive effects only when it is accompanied by appropriate cognitive changes and negative effects when it is not. The assumption that crying is either good or bad for one's health or well-being may thus be overly simplistic.

### **Crying and health: exploring possible relationships**

As Kasl and Jones (2001) make clear (see also Vingerhoets et al, in press), before one can conclude that there is a *causal* relationship between a psychosocial factor and one's health status, certain requirements should be met. The first one implies that the causal factor should precede the consequences. More specifically, one needs to exclude the possibility that crying or the inhibition of crying is a consequence of the affected health status or of the medications that the patients use. Retrospective studies, such as the one by Crepeau (1980/1981) therefore have only limited value for the discussion whether or not there is a causal effect. One further cannot rule out the possibility that – much similar as has been proposed in the buffering model of social support – crying is only beneficial if

one is in distress and not when someone leads a normal and happy life. Finally, the possibility of the “third variable” should be considered. This implies that there might be a relationship between a third factor (e.g., personality or coping) and, on the one hand, crying and, on the other hand, health. As a consequence, spurious relationships between crying and health may ensue from such connections. In conclusion, even if one finds a relationship between crying and health, one should always be critical and prepared that it actually may not be a causal one.

A second important requirement discussed by Kasl and Jones (2001) that deserves our attention, concerns the biological plausibility of the relationship. Given the current state of psychobiological knowledge, how realistic is the assumption that such a relationship really exists? What are the psychobiological mechanisms that mediate cause and effect? This important question, until now, has hardly received any attention. Except for the unlikely hypothesis of Frey (1985) about the removal of toxic substances, hardly any serious alternative has been formulated. Inspired by the work of Panksepp (1998), Vingerhoets and Scheirs (2001) speculate that crying may stimulate the release of endorphins. Panksepp specifically describes the facilitation of recovery and restoring homeostasis after one has been in distress as an important function of these substances. In addition, endorphins are well-known for their pain-relieving powers. At least theoretically, these two features render this substance a serious candidate as mediating the crying – relief association. However, until now, no studies have systematically tested this hypothesis.

The other requirements, discussed by Kasl and Jones (2001) address the need of replication evidencing consistency of the evidence, the strength of the association, and the biological gradient. These requirements, however, gain in relevance once a clear association between crying and well-being or health has been reported. Unfortunately, as for now, it is premature to draw any conclusions. Obvious questions are still waiting for answers. For example, how is the self-reported mood improvement related to the emotion that triggered the crying episode? Does the presence of others or, more generally, one’s social environment or culture influence how one feels after having cried. One could argue that one’s mood is negatively affected after having cried in a context that generally is considered as not appropriate, resulting in strong disapproval. Some preliminary evidence reported by Becht and Vingerhoets (in press) indeed suggests that cultural factors play a role. In their study with country characteristics as predictors of mood after crying, among others, Masculinity – Femininity and shame (over crying) showed up as predictors, indicating that in more masculine countries, where people experience much shame over crying one generally reports less mood improvement after a crying episode than in more

feminine countries, where crying is more accepted.

To conclude, more effort should be spent designing proper studies focusing on this kind of relevant research questions and in quasi-experimental studies, adequate attention should be paid to contextual/cultural factors affecting appraisal and pre-crying mood of criers and non-criers.

### **Summary and conclusions**

Summarizing the research that has been conducted so far, it cannot be concluded that crying has a straightforward cathartic function. It does not appear to be necessarily beneficial to one's health either. The relevant studies that have been done so far can be divided into two categories: retrospective, descriptive self-report studies and more controlled, quasi-experimental studies. Results of these studies show a marked discrepancy in their results. In most retrospective self-report studies, at least half of the participants indicated that crying had a relieving and relaxing effect, and that crying led to a decrease in negative mood. Controlled studies, however, failed to yield corresponding findings. In such studies, crying appeared to increase depressive feelings and arousal, or the other way around. Thus, as yet, scientific research has not been able to come up with any conclusive results regarding the effects of crying on well-being.

The study of the effects of crying on well-being and health remains a challenge for researchers. Until more well-designed research has been conducted, no definitive conclusions can be drawn about the presumed relationship between crying and catharsis and/or health. Without adequately controlled designs, study results cannot be interpreted properly, and the direction of cause and effect relationships cannot be determined with certainty. This is important because one of the first things any theory of crying must do is to delineate the functions of crying. Indeed, in order to be able to develop any model not to say comprehensive theory of crying, we first need to learn more about both the *intra-* and *interpersonal* functions of crying. The obvious implication of the state of affairs described above for theories of crying is that we are, unfortunately, still not entirely able to do this given our present knowledge.

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