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EFFECTIVENESS OF PSYCHOLOGICAL SUPPORT BASED ON POSITIVE SUGGESTION WITH THE VENTILATED PATIENT¹

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The purpose of intensive care is recovery from the critical state with the best possible quality of life. Lengthy therapy with its physical and psychological complications and iatrogen effect may spoil the expected outcome. The positive effect of the psychological support of the patient that can be proven empirically has been applied and examined in the present study. In the present prospective, randomised, controlled study the patients – mechanically ventilated for more than 48 hours – of two intensive care units of Budapest have been examined. In the study they were given psychological support based on positive suggestions (PSBPS) using their susceptibility induced by the situation, complementing their somatic treatment. Altogether 60 persons have been examined (27 in the control, 33 in the suggestion group). The result showed a statistically significant 2.5 day shorter ventilation period ($p < 0.04$). The length of stay (LOS) in the intensive care unit (ICU) was also reduced by 4 days in the group who received suggestions. If the patient was treated by the same psychologist during at least 50% of the ICU stay, both parameters were reduced by 3.5 days at a significance level of $p < 0.01$. In the case of those patients with the same psychologist who died during the study, it was mainly their age and state that contributed to their death. Their dying was 4.5 days shorter or they left the ICU sooner than the control group members, in whose case lengthy ventilation was typical.

Keywords: intensive care unit, quality of life, outcome, length of stay, length of mechanical ventilation, mortality, suggestive communication, psychological support, basic needs, post traumatic stress disorder, post traumatic growth

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Die Wirksamkeit psychischer Unterstützung auf der Grundlage positiver Suggestionen bei beatmeten Patienten: Das Ziel einer Intensivtherapie ist die Überwindung eines kritischen Zustandes bei gleichzeitig möglichst hoher Lebensqualität. Eine sich hinziehende Behandlung mit physischen und psychischen Komplikationen kann iatrogen das zu erwartende Behandlungsergebnis beeinträchtigen. Die vorliegende Studie belegt die empirisch zu beweisende positive Wirkung der psychischen Unterstützung der Patienten. In unserer prospektiven, randomisierten und kontrollierten Untersuchung ließen wir auf zwei Budapester Intensivstationen länger als 48 Stunden lang beatmeten Patienten – unter Ausnutzung der aufgrund der Situation erhöhten Empfänglichkeit für Suggestionen – als Ergänzung der somatischen Behandlung eine auf positiver Suggestion basierende Unterstützung zukommen. Es wurden insgesamt 60 Personen untersucht (27 Kontrollpersonen, 33 mit Suggestion Behandelte); bei der zusätzlich mit Suggestion behandelten Gruppe ergab sich statistisch signifikant ($p < 0,04$) eine mehr als 2,5 Tage kürzere Beatmungszeit und eine 4 Tage kürzere Verweildauer auf der Station. Wenn sich während mindestens 50% der auf der Station verbrachten Zeit der gleiche Psychologe mit dem Patienten beschäftigte, reduzierten sich beide Parameter bei einem Signifikanzniveau von $p < 0,01$ um 3,5 Tage. Bei den stets vom gleichen Psychologen behandelten Patienten trat während der Untersuchung der Tod vor allem aufgrund hohen Alters oder eines schwerwiegenden Krankheitszustandes ein. Die terminale Phase verkürzte sich jedoch um 4,5 Tage oder die Patienten konnten die Station früher verlassen als die der Kontrollgruppe, in der die Sterbenden zumeist längerfristig beatmet wurden.

Schlüsselbegriffe: Intensivtherapie, Lebensqualität, Behandlungsergebnis, Dauer der Beatmung, Verweildauer auf der Station, maschinelle Beatmung, terminale Phase, suggestive Kommunikation, psychische Patientenführung, Grundbedürfnisse, posttraumatisches Stresssyndrom (PTSD), posttraumatisches Wachstum

1. Characteristics of the intensive care unit (ICU)

1.1. The purpose of intensive care

The purpose of ICU therapy is the replacement and re-establishment of vital functions (PÉNZES & LENCZ 2003) in a way that attains the best possible quality of life for the patient. The expected quality of life is hard to estimate even though the cost-effectiveness and quality of health care could be improved if it could be better estimated what the expectations of an ICU patient could be; in this way limited resources could be used more efficiently (PERUZZI 2001).

Comparing data of studies created in the 90s, approximately 50% of patients treated in ICU die (PRANIKOFF et al. 1997; PÉNZES & LORX 2004). This means, practically, that in some cases respiratory failure is part of the end of life process. This explains why it is a more and more important goal for ICU professionals to reduce the mechanically supported, enlengthened death process (KOLLEF 2000). Both financial and humane causes are the reasons for this. According to KOLLEF (2000) the end of life treatment strategies should be developed in a direction where instead of invasive life support therapy, it is the satisfaction of the patient and family that is given a greater role.

If intensive care becomes necessary for a person, this in itself has a negative effect on their future quality of life. This raises the necessity of being able to determine if a patient can expect a poor quality of life after leaving the ICU, as those patients will need further support after their discharge (GRADY 2001).

1.2. Psychological and iatrogenic effects of ICU therapy

This traumatic, hard-to-process event, which would make the follow-up therapy necessary and which in itself has a negative effect on the expected quality of life happens in the ward: both on a physical and psychological level. The longer the therapy – often including mechanical ventilation – the more possibilities arise for iatrogenic damage. Several complications can be expected (PÉNZES & LORX 2004) and the greater the number of days spent in mechanical ventilation, the greater the number of negative emotional responses of the patients (MENZEL 1998). As it can also be seen in RONTONDI et al.'s analysis (2002), ICU care is perceived by patients as an extremely traumatic experience, which may trigger PTSD, which is not a token of a flourishing quality of life either.

Earlier studies of our research team also show a similar result (SZÉKELY & PERCZEL-FORINTOS 2005; BENCZÚR & MOHÁCSI 2005). As SCHELLING et al. already pointed out in 1998, in order to avoid PTSD, psychological support in the ICU also needs to be intensive. As a 1998 study shows, more care from the part of health care practitioners had a calming effect on both patient and family, who in this way had a stronger feeling of safety. Good communication has proven to have a therapeutic effect, while improper communication was found to be a source of distress, which results in less optimal recoveries after discharge. Positive communication, on the other hand, encouraged patients to become involved in their own therapy. It also enhances cooperation between patient and the team and speeds up recovery (RUSSEL 1999; DIÓSZEGHY & VARGA 2002; VARGA & DIÓSZEGHY 2001; VARGA 2004).

1.3. ICU, as a reason for negative or positive trance, thus a chance for a negative or positive outcome

ICU is an unknown world for the patients, where they unexpectedly fall into a severe and defenseless state. They are vulnerable to an increased emotional and physical stress load, even to painful physical interventions, where they lose their grip (BEJENKE 1996). They encounter a different reference system without a safe support point they could relate their experiences to. Based on the nature of the situation, their thinking will be characterised by primary process thinking, where one understands everything literally, referring to oneself and moreover in the most negative possible way (BONKE 1990). A negative trance state is created (CHEEK 1969). Everything has the powerful effect of suggestion, following the hierarchy of health care, thus the words of health care professionals have the strongest effect (BEJENKE 1996). However, it is important to

realise that this state can be used, seized and with the appropriate techniques turned into something positive, so that it serves the healing process (DIÓSZEGHY et al. 2000; VARGA & DIÓSZEGHY 2001). Thus our research team, for the protection of quality of life – uniquely so far – started intervention on the spot, using the trance resulting from the situation.

1.4. Mortality

As we have mentioned, intensive care carries the possibility of much iatrogenic harm. Thus, the later someone is weaned off mechanical ventilation, the more the chance for complication, which may raise a mortality risk. ICU stay itself is a challenge for the immune system, especially in a weakened state. The stressful environment, the lack of calm, the upset biological clock and sleep system have a negative effect (KRACHMAN et al. 1995). All this, understandably, also has a negative effect on the expected quality of life.

If psychological support based on positive suggestions therapy PSBPS (VARGA et al. 2007) helps weaning off mechanic ventilation and an earlier discharge from the ICU, it can be supposed that it prevents some complications, which is, furthermore, likely to result in a better quality of life. This theory would be proven if we found that those who die within the suggestion group are different in their being older and in a worse physical condition from those who leave the hospital alive. In other words they died because they were really in a condition when dying is natural. While in the case of the members of the control group, it is the lengthy therapy and mechanical ventilation that lead to complications and a shorter therapy could have given a chance for life. As a conclusion, it is the length of the ICU stay and ventilation that separates the living from the dead.

2. The study

2.1. Characteristics of the study

This prospective, randomised, controlled study was conducted in the intensive care units of two Budapest hospitals: Semmelweis Egyetem, Aneszteziológiai és Intenzív-terápiás Klinika (AITK) (Semmelweis Medical University, Department of Anaesthesiology and Intensive Care Unit) and Jahn Ferenc Kórház (JFK) (Jahn Ferenc Hospital). In the study, the group of randomly selected ventilated patients were provided with information built on positive suggestions each day of their stay over a period of 20 minutes (hereafter called: suggestion group). Semi standard suggestions were applied following the principles of psychological support based on positive suggestions (PSBPS), which could be adapted to the current state and needs of the patient. The methodology protocol has been reported in the article of VARGA et al. 2007.

The control group was provided with usual ICU care, without PSBPS. Both objective and subjective variables have been examined. In this paper we focus on the objective outcome measures.

2.2. Objective and hypothesis

The objective of the study is to examine the effectiveness of PSBPS in the case of mechanically ventilated patients. Our hypothesis is that (1) positive suggestions ease weaning off mechanical ventilation and (2) they speed up recovery. We also suppose that as positive suggestions reframe the negative stresses coming from the environment (3) the suggestion group feels themselves to be safer and are more positive.

2.3. The sample

The criteria for selection were a minimum of 48-hour ventilation, a minimum age of 18 years and the chance of life prospects of more than 30 days. Excluding criteria were a severe hearing impairment or a serious psychiatric diagnosis. The patients selected according to these criteria were then randomly separated out into the suggestion and control groups.

74 patients participated in the study and followed the process. Analysis took place after trimming the data. The patients with extremely deviant results from that of the sample were trimmed. Those who participated in this way were over 30 years of age, had been mechanically ventilated for more than 48 and less than 600 hours and had spent less than 700 hours in the ward. 9 patients dropped out of the study because finally they were ventilated for less than 48 hours. Out of this, 2 suggestion and 1 control patient died within 48 hours, 1 patient from both groups died in the hospital and 1 control and 3 suggestion patients were discharged alive. Thus the data of 60 persons have been processed. The patient number of the control and suggestion groups is shown in *Table 1*.

Table 1
Patient number in the control and the suggestion group

	<i>Patient number</i>		
	<i>AITK</i>	<i>JFK</i>	<i>SUM</i>
<i>Control group</i>	10	17	27
<i>Suggestion group</i>	12	21	33
<i>Sum</i>	22	38	60

2.4. Psychologists

Psychologists who have been specially trained in PSBPS were delivering the suggestions. In the two hospitals altogether 11 colleagues were involved in the study, only one of them had a stable psychologist status in the ICU, all the others volunteered for this work for 1 year.

2.5. Examined data

The patients' age and the New Simplified Acute Physiology Score (SAPS II) were used to compare the members of the groups of the present study. SAPS gives a value in relation to the arrival state, which shows the chances of mortality in percentages, that is the severity of the state. As outcome measures we examined the length of stay (in hours, LOS) and the mechanical ventilation (in hours, MVH²). Immediately on their discharge from the ICU the patients were interviewed on their subjective experiences. The detailed results of this data have been reported elsewhere (BENCZÚR et al. 2006).

3. Processing of data

3.1. Preliminary processing of patients' data who left the ICU alive

In the first analysis of the data (BENCZÚR et al. 2006) the only focus of analysis was the effect ICU had on the patients who were discharged alive and the effect the psychological support, based on positive suggestions (PSBPS), had on them.

Considering the objective data of the sample of those patients of both hospitals who left alive (15 persons of the control, 24 persons of the suggestion groups) on $p < 0.11$ level the ventilation time of the suggestion group was 44.6 hours shorter compared to the control group. Considering the data of JFK only (11 control/15 suggestion) it was shown on $p < 0.09$ level (mean diff = 64.7, $t = 1.7$, $df = 24$). In JFK's case the LOS showed a tendency level positive difference (mean diff = 89.4, $t = 1.5$, $df = 11.6$, $p < 0.14$). But in the entire sample this cannot be found.

3.2. Common analysis of living and dead

However, as we have already cited based on international data, 50% of mechanically ventilated patients of ICU die. The fact that the number of people with chances to live

² Usually MV is used as abbreviation in the literature. Studies differ in their measurement of MV in days or hours. In order to signify that for greater preciseness we used hours as units, we use this abbreviation.

or die is equal justifies the fact that the main focus of this study is not on survival but on the length and comfort of the stay.

3.2.1. Characteristics of the entire sample and differences between the two hospitals

Characteristics of the entire sample of 60 persons and differences between hospitals are shown in *Table 2*.

Table 2
Characteristics of sample and differences between hospitals

	<i>AITK</i> <i>n = 22</i>		<i>JFK</i> <i>n = 38</i>		<i>Mean diff.</i>	<i>p</i>
	<i>Mean</i>	<i>Std. dev.</i>	<i>Mean</i>	<i>Std. dev.</i>		
<i>Age</i>	63.36	11.66	70.86	9.55	-7.50	0.009
<i>SAPS</i>	46.22	17.57	56.47	20.93	-10.24	0.058
<i>LOS</i>	301.56	135.27	238.59	123.59	-62.97	0.07
<i>MVH</i>	206.75	137.25	173.51	102.71	33.23	0.33
<i>CTRL</i>	<i>n = 10</i>		<i>n = 17</i>			
<i>Age</i>	64.7	12	70.82	18.34	-6.12	0.13
<i>SAPS</i>	46.20	18.71	55.76	18.73	-9.56	0.212
<i>LOS</i>	284.5	133.95	291.02	153.87	-6.52	0.912
<i>MVH</i>	224.35	143.87	217.02	119.43	7.32	0.888
<i>SUGG</i>	<i>n = 12</i>		<i>n = 21</i>			
<i>Age</i>	62.25	11.77	70.90	10.64	-8.65	0.038
<i>SAPS</i>	46.25	17.40	57.04	23.01	-10.69	0.179
<i>LOS</i>	315.79	140.59	196.14	70.28	119.64	0.015
<i>MVH</i>	192.08	132.05	138.28	72.05	53.79	0.223

As the values of age and SAPS show, the general physical conditions of suggestion and control groups' members are very well-balanced: within the same hospital, in the control and suggestion group there is no significant difference in age and SAPS, as we can see it in *Table 3*.

Table 3
Differences between controll and suggestion group

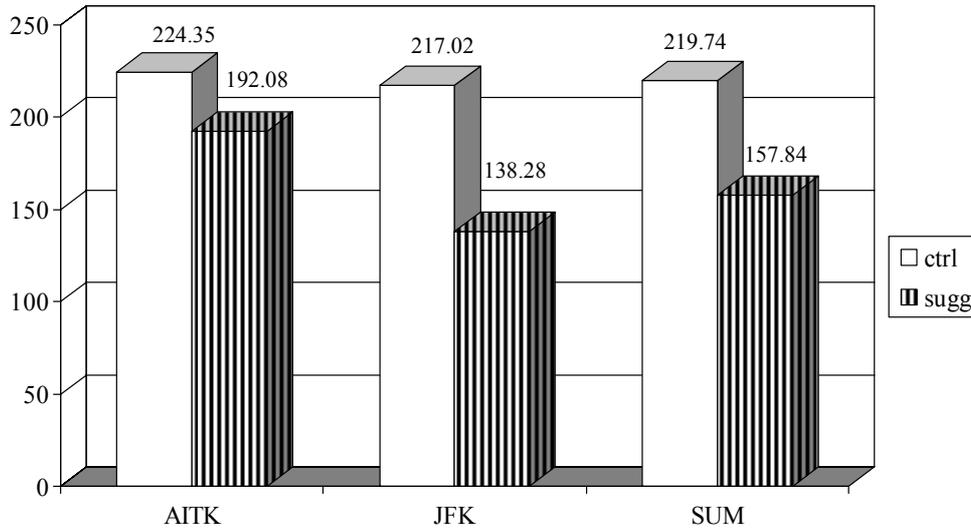
	SUM		CTRL		SUGG		Mean diff.	p
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.		
<i>AITK</i>	<i>n</i> = 22		<i>n</i> = 10		<i>n</i> = 12			
<i>Age</i>	63.36	11.33	64.70	12	62.25	11.77	2.45	0.635
<i>SAPS</i>	46.22	17.57	46.20	18.71	46.25	17.40	0.05	0.995
<i>LOS</i>	301.56	135.27	284.50	133.95	315.79	140.59	-31.29	0.601
<i>MVH</i>	206.75	137.25	224.35	143.87	192.08	136.05	32.26	0.595
<i>JFK</i>	<i>n</i> = 38		<i>n</i> = 17		<i>n</i> = 21			
<i>Age</i>	70.86	9.55	70.82	8.34	70.90	10.64	0.08	0.980
<i>SAPS</i>	56.47	20.93	55.76	18.73	57.04	23.01	-1.28	0.854
<i>LOS</i>	238.59	123.59	291.02	153.87	196.14	70.28	94.88	0.028
<i>MVH</i>	173.51	102.71	217.02	119.43	138.28	72.05	78.74	0.025
<i>SUM</i>	<i>n</i> = 60		<i>n</i> = 27		<i>n</i> = 33			
<i>Age</i>	68.11	10.90	68.55	10.08	67.75	11.68	0.79	0.78
<i>SAPS</i>	52.71	20.23	52.22	18.95	53.12	21.51	-0.89	0.866
<i>LOS</i>	261.68	130.30	288.61	144.19	239.65	115.32	48.95	0.149
<i>MVH</i>	185.70	116.54	219.74	126.32	157.84	101.48	61.89	0.04

A difference was found between hospitals: JFK patients were significantly older (mean diff. = 7.5, $t = 2.7$, $df = 58$, $p < 0.009$), and were in a worse physical condition according to their SAPS scores than AITK's patients (mean diff. = 10.24, $t = 1.9$, $df = 58$).

Comparing the two hospitals' control groups we can see there is no difference between LOS (mean diff. = 6.5, $t = -0.11$, $df = 25$, $p < 0.91$) and MVH (mean diff. = 7.32, $t = 0.14$, $df = 25$, $p < 0.88$) scores. Therefore between the two hospitals there is no basic difference in the average expected length of ventilation and care.

Considering the entire sample, the suggestion group's length of ventilation was 61.89 hours shorter than that of the control group, which is significant at level $p < 0.04$ ($t = 2.1$, $df = 58$) (see *Figure 1*).

Considering the data of JFK, only the length of ventilation was 78.74 hours significantly shorter ($t = 2.35$, $df = 25.07$, $p < 0.02$), and suggestion group patients left the ward 94.88 hours (3.9 days) earlier than those of the control group ($t = 2.38$, $df = 21.37$, $p < 0.02$).



On the entire sample the suggestion group's MVH decrease was 2.5 days ($p < 0.04$)
 On JFK's data the decrease of LOS and MVH was more than 3 days ($p < 0.02$)

Figure 1

Length of mechanical ventilation in the control (ctrl) and the suggestion (sugg) group

3.3. Why do the results of the two hospitals differ?

What justifies this difference between the two hospitals while the applied methods are the same in both? The general ventilation time is also identical, as we could see in the comparison of the control groups. The state of the patients in JFK is worse. What explanation can there be for the fact that in this hospital the results of the suggestion group were significantly better than those of the control group?

A notable difference lay in the practice that in the case of JFK patients it was the same psychologist who dealt with the patients in at least 50% of their days spent in the ward, while in AITK the patients were looked after by different psychologists. JFK is the only hospital in Hungary that has a psychologist status at its ICU, thanks to the earlier efforts of our team and to the open attitude of the department. This made it possible for the psychologist working at the ICU to have a more stable presence and the other psychologists who attended this department also spent relatively more time there. In the meantime, at AITK, the number of psychologists mobilised for the study was higher and their workload was more equally distributed.

4. The study in the reflection of a new hypothesis

4.1. The new hypothesis

We can assume that having the same psychologist has a stronger positive effect as several psychological theories support the necessity of attachment and a relationship for normal life at each life stage. Why would it be any different in a life threatening, critical state?

This is why we think that the effect of positive suggestions is authenticated and reinforced by the relationship attached to it. Thus, in the case of the patients where the psychologist is the same, meaning that in more than 50% of their time the same psychologist takes care of them (same psy), our original hypotheses prevail more strongly than in the case of those who have alternating psychologists (alt.psy).

4.2. The study results analysed according to the new hypothesis

4.2.1. Group with a same psychologist, group with alternating psychologists, control group

This is why it is worth separating out the suggestion group into two in this way: to those who had alternating psychologists taking care of them in at least 50% of their time spent in the ward (alt.psy) and to those who had the same psychologist in at least 50% of their time spent in the ward (same psy).

The data of the two hospitals compliment each other, as the ratio of the two groups was 10 to 2 at AITK and 2 to 19 at JFK (see *Table 4*).

Table 4
Patient number in the control group, the group with alternating
and with the same psychologist

	<i>Patient number</i>		
	<i>AITK</i>	<i>JFK</i>	<i>SUM</i>
<i>Control group</i>	10	17	27
<i>Alternating psychologist</i>	10	2	12
<i>Same psychologist</i>	2	19	21

This makes it possible to test the hypothesis that in addition to the positive suggestions given to ventilated patients it is the relationship attached to it that has a strong positive effect.

Comparing the control group and the group with the same psychologist, the group with the same psychologist left the ward 88.42 hours (3.6 days) earlier, which is significant at level $p < 0.009$ ($t = 2.75$, $df = 40.5$) (see *Figure 2*) and the length of mechanical ventilation was shorter by 81.95 hours (3.4 days) ($t = 2.83$, $df = 42.57$, $p < 0.007$) (see *Figure 3*).

The significant differences between the control group, and the group with an alternating and with the same psychologist are summarised in *Table 5*.

Between the control group and that with an alternating psychologist there is no significant difference in any examined variable. Comparing patients with alternating or the same psychologist, we can see patients with an alternating psychologist spent 108.51 more hours (4.5 days) in the ICU, that is a significant difference ($t = 2.44$, $df = 14.44$, $p < 0.028$) (see *Figure 2*).

4.2.2. Mortality data

50% of our ventilated patients died, independently of group or hospital in the two weeks following discharge (see *Figure 4*).

Comparing all surviving patients with all who died in the study, those who died were significantly older by 7.61 years ($t = 2.85$, $df = 58$, $p < 0.006$), and had 15 more points on SAPS scores measuring the severity of condition ($t = 3.18$, $df = 58$, $p < 0.002$) and were ventilated more by 88 hours ($t = 3.19$, $df = 57.9$, $p < 0.002$). The length of stay on the ward does not distinguish them from each other.

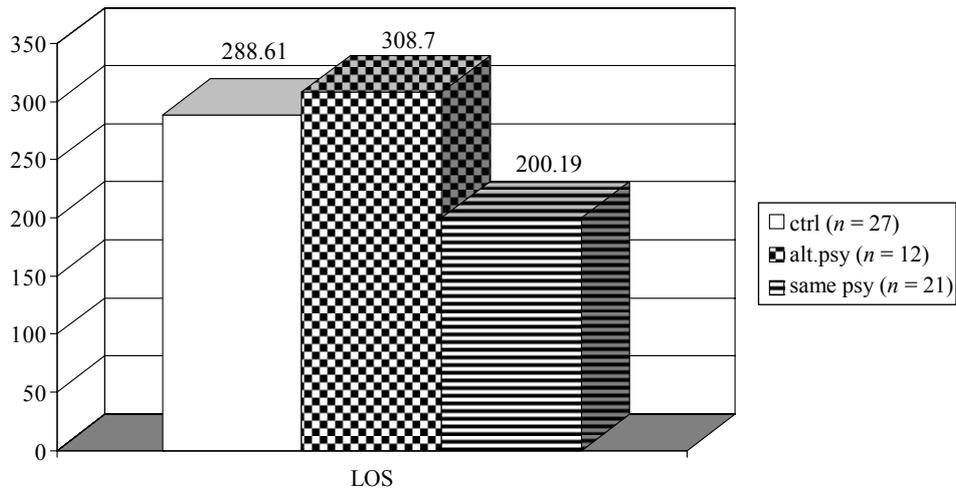
Comparing the surviving members of the group with the same psychologist with their dead members, we can see that the factor where they are significantly different from each other is age (mean diff. = 11.67, $t = 2.7$, $df = 19$) and SAPS (mean diff. = 24.24, $t = 2.86$, $df = 19$) (see *Figure 5*).

Comparing surviving members of the control group with those who died, we can see the length of mechanical ventilation as a factor distinguishing them from each other (mean diff. = 93.98, $t = 2.0$, $df = 25$, $p < 0.056$) (see *Figure 6*).

Comparing the dead who died already in ICU, the dead of the group with the same psychologist spent 114 hours (4.75 days) less in the ICU ($t = 2.02$, $df = 16$, $p < 0.06$) and had been ventilated less by 101 hours (4.2 days) ($t = 1.86$, $df = 16$, $p < 0.08$). Considering the data of all of our patients dead in the hospital, the LOS was shorter by 110.75 hours (4.6 days) ($t = 2.77$, $df = 25$, $p < 0.01$) and the MVH was shorter by 110.44 hours (4.6 days) ($t = 2.81$, $df = 25$, $p < 0.009$) in the group with the same psychologist (see *Figure 7*).

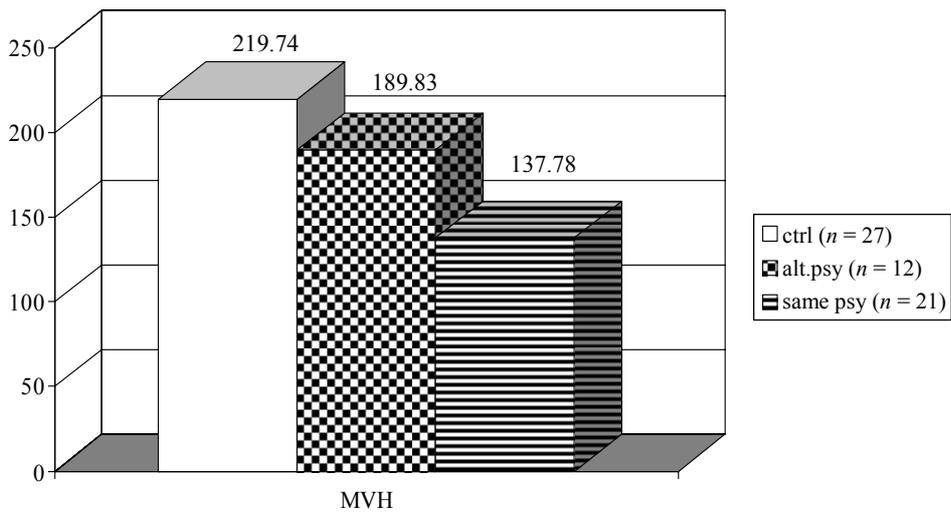
5. Discussion

In our study we have thus been able to prove the efficiency of PSBPS (VARGA et al. 2007) with ventilated patients. The length of their treatment has been significantly reduced, and the weaning period was also, on average, 3.5 days quicker. The effect could



Same psy group left ICU 3.5 days earlier than ctrl group ($p < 0.009$), and interestingly 4.5 earlier than alt.psy group ($p < 0.02$)

Figure 2
Length of stay (LOS)

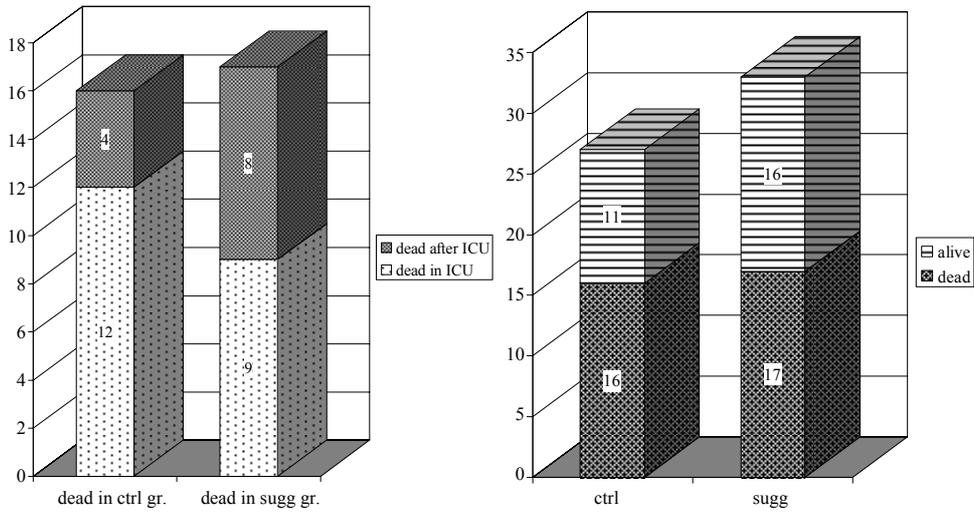


Same psy group's members were ventilated 3.5 days less ($p < 0.007$)

Figure 3
Length of mechanical ventilation (MVH)

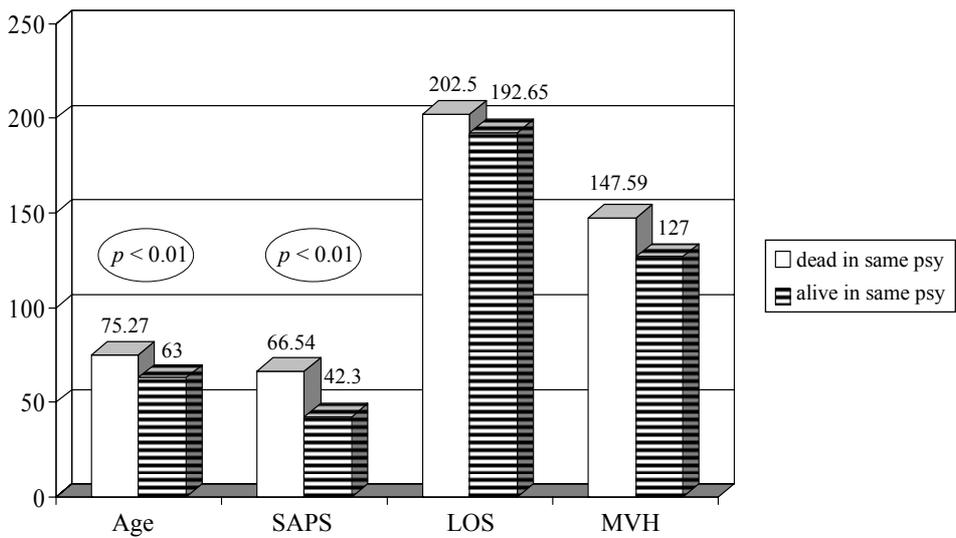
Table 5
Significant differences between the control group, the group with an alternating (alt.psy)
and with a same psychologist (same psy)

	Ctrl		Alt.psy		Same psy		Comparisons				
	Mean	Std dev.	Mean	Std dev.	Mean	Std dev.	Ctrl/same m.diff.	p	Ctrl/alt m.diff.	p	Alt/same m.diff.
AITK	n = 10		n = 12		n = 2						
JFK	n = 17		n = 3		n = 19						
LOS	291.02	153.87			190.76	69.12	100.26	0.022			
MVH	217.02	119.43			129.94	68.75	87.08	0.014			
SUM	n = 27		n = 15		n = 21						
Age	68.55	10.08	64.33	11.42	69.71	11.63					
SAPS	52.22	18.95	49.83	19.96	55	22.61					
LOS	288.61	144.19	308.70	143.50	200.19	73.85	88.42	0.009			108.51
MVH	219.74	126.32	192.95	135.80	137.78	71.91	81.95	0.007			0.028



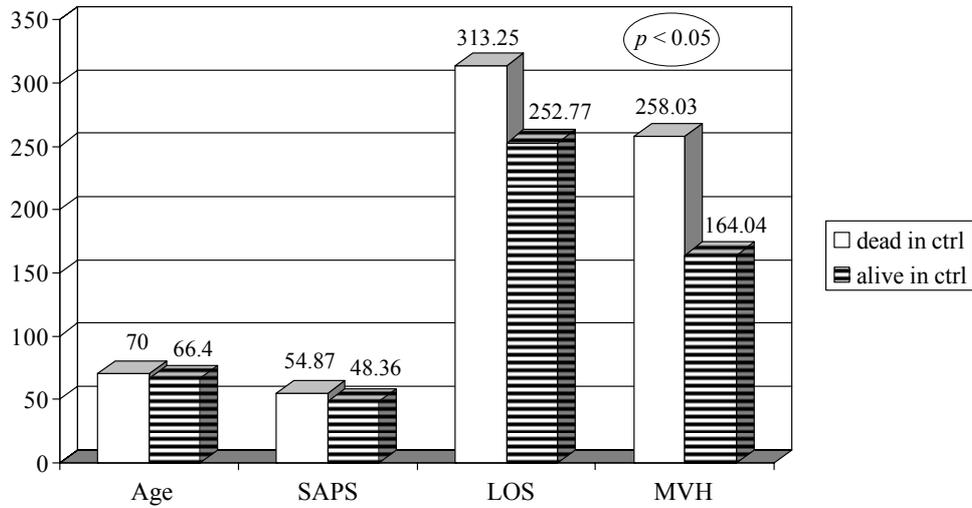
50% of patients died, independently of group or hospital the latest 2 weeks after discharge

Figure 4
Mortality



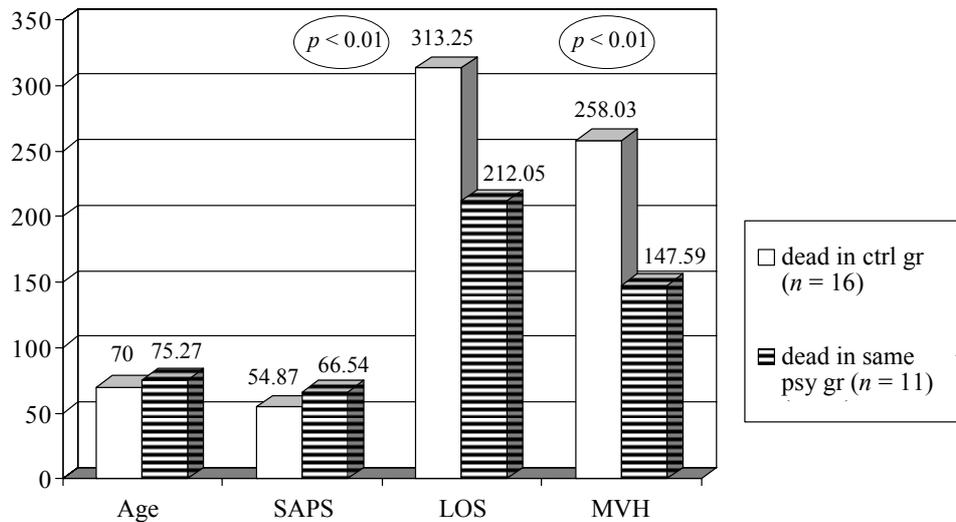
Patients who died in same psy group were 12 years older and had 24 more points in SAPS than those who stayed alive

Figure 5
Data of dead and alive patients in the group with a same psychologist



Patients who died in control group did not differ in age and SAPS from those who stayed alive, but in the length of mechanical ventilation

Figure 6
Data of dead and alive patients in the control group



The dying process of patients in same psy group was 4.5 days shorter than those in a ctrl group

Figure 7
Data of dead patients of control group and of group with same psychologist

be especially well captured if the suggestions were delivered by the same psychologist in at least half the time of the ICU treatment. From the fact that in the group with the same psychologist it was mainly the aged patients and those in a worse condition who died, while in the control group it was those who were ventilated for a long time, we can draw the tentative conclusion that in the case of the suggestion group the iatrogenic effects could also be reduced, which may enable a better quality of life in the future.

5.1. Challenges and limits of the study

Several challenges arose on the course of the study, which, in some cases, limits our results, but in the meantime represents the characteristics of the ICU community.

5.1.1. Selection of subjects

As it can be seen, already in the selection of patients it was difficult to meet the requirements of the 30-day survival criteria definition as several patients died before the mentioned 30 days, and it was also the case that sometimes patients who had been said to have no chances, and thus were not selected to participate in the study, left the ICU in a good state after treatment. This illustrates very well how unpredictable the life chances of human beings are on the border of life and death when requiring intensive care. This questions, however, whether it is possible to realise the aforementioned objective (PERUZZI 2001; GRADY 2001): to be able to make decisions on the applicable therapy options depending on the foreseeable quality of life.

On the other hand it is important to see that apart from the basic including and excluding criteria there were no other criteria applied in the study. This means that PSBPS can be applied in many forms of diseases, in various age groups with patients in various physical and mental states.

5.1.2. Control group without suggestions

It causes a problem that there was no control group which would have received 20 minute extra care a day without the application of suggestions. The creation of a “psycebo” group was ruled out due to ethical (STREET & LUOMA 2002) and practical reasons.

5.1.3. Blindness of the ICU team towards the suggestion group

Another problem was raised by the fact that the ICU team was not blind towards patients' group membership, so if they were following their activities it could be deduced

who was the patient who received extra attention. On the other hand, it would have been difficult to avoid their awareness. During the planning of the study it was part of our aim that the presence of the psychologist in the team and the co-operation with them should be natural for the ICU team.

5.1.4. Standardisation of suggestions

We would have liked to create a standard, easy-to-use for all, and a mechanically applicable set of suggestions. However, we did not find it possible due to the uniqueness of the cases and to the versatile nature of ICU situations. On the other hand, it is also an advantage of the study that we could move towards the individual needs of patients.

5.1.5. Difference between hospitals

Another limitation in the interpretation of the results was that the majority of the group with the same psychologist stayed in one hospital, while the group with alternating psychologists stayed in the other. Even though the similarity of the two control groups tends to prove that the difference between hospitals does not have a great effect on the recovery of patients, the role of the differences between hospitals in the applicability of suggestions cannot be completely ruled out.

Another point that occurred is that the stable psychologist dealing with patients would be likely to have a better knowledge of the place. This way they could be calmer, more confident, thus being able to channel calmness and safety in a more credible way. They could have more practice so even an unexpected situation may be familiar to them; the problems arising may be easier for them to handle. They are likely to be more committed.

All this might easily be right. This supports the idea that there is reason to apply a stable psychologist in the ICU team, whose skills will thus develop and might become fruitful for the benefit of patient and family, for the personnel, and thus for health care.

It would certainly be useful to realise a study varying stable and alternating conditions, in order to be able to consciously test the importance of this variable.

5.2. Theory of benefits of steadiness and continuity of care

KULCSÁR (in press) attributed this effect to familiarity, which might be an important therapeutical tool in extreme situations and in the case of illness it can work as an objective healing force through special cerebral mechanisms. Biological sensitivity to context has a negative effect on the health condition in a hostile environment and a positive effect in a supportive, protective environment (SUOMI 1997; BOYCE et al.

1995; BOYCE & ELLIS 2005). Strong stress makes this sensitivity stronger, and a protective environment can be provided by empathic care.

The stressful environment of the ICU in the crisis situation of the critical state gives way to post traumatic stress disorder (PTSD) and also to post traumatic growth (PTG). The definition of PTG, based on TEDESCHI & CALHOUN (2004): the experience of positive change resulting from the fight against seriously challenging life crisis situations.

If in a stress situation all the needs known from Maslow's pyramid of needs can be fulfilled, the possibility of PTG arises. If any of these needs is missing however, it gives way to PTSD. This is why we have an especially great responsibility towards patients in a critical state.

These feelings accompany us during all our lives, they only adapt to changes in our life situations. Thus, it is understandable that in a state as defenseless as that of a baby, or even as that of an ill baby, then our needs will appear in the same form as at the age of a baby. Consequently, what we know from Harlow's and Spitz's well known studies is that the life supporting factor is not the physical care itself but the caregiver, the warmth and relationships. These are also essential conditions of life in the later stages. Without this we will suffer from damage on a social, physical and emotional level. This characteristic typical for social beings receives a particularly strong emphasis in stressful situations.

In a stressful situation the alteration of the hippocampus-amygdala operation, the cerebral activity, is advantageous for the appearance of an altered state of consciousness. In such a situation social sensitivity becomes stronger and thus the need for affection, the need to belong, the need for a good word also grows. The attention will be focused and independent of context, things will be perceived as extremely positive or negative. The object of attention will be equal to the self, the boundaries of the self dissolve, the self-nonself distinction weakens or discontinues (KULCSÁR 2005). This opens up the need of attachments in both spiritual and social directions.

This altered cognitive processing method is characterised by an increased susceptibility to suggestions (VARGA 2004) where it is the framing that defines whether the stimuli of the environment are perceived as positive or as negative. This frame will be defined for the patient by those who get within their self boundary. Who this person is – either positive or negative – will be defined by the dominance hierarchy as stressed by BEJENKE (1996).

Several studies have proven that we have a separate cerebral mechanism for the detection of the reliability of the other (WINSTON et al. 2002; SINGER et al. 2004). This trust may be undermined in the case of alternating psychologists who show the promise of a relationship but cannot provide it due to their rare and unpredictable visits.

The psychologist who is reliably present at the ICU, satisfying the above mentioned social needs, in the role of the same and continuous caregiver can empirically recognise the current psychological needs of the patient. In this way, instead of the traumatic perception of the experience and the development of PTSD, they may guide the patient towards post traumatic growth.

This also shows that in addition to the time spent with the patient the role of suggestions is also significant. There are several people in the environment of each patient who reliably spend much time with them. However, it was only in the case of the psychologist who was continually with the patient that the merging of time and suggestions prevailed, and this alone resulted in better recovery.

5.3. Summary of results

We have thus managed to prove our hypotheses.

Analysing the patients discharged alive from the ICU considering the length of mechanical ventilation, we got a shorter ventilation time on a tendency level in the common data of the two hospitals, which is more strongly manifested considering the data of JFK only. This means 3.5 days shorter ventilation period and the difference can be seen in the shorter stay in the ICU as well.

As for subjective experiences, it turns out from the content analysis of the interviews recorded on leave that the suggestion group reports more positive experiences, more positive contacts and a greater environment consciousness. This, as we know, is a protective factor against PTSD (SZÉKELY & PERCZEL-FORINTOS 2005).

The fact that dying people are admitted to health care institutions more and more often makes it important to pay equal attention to those living and dying in an ICU analysis.

During the common analysis of the living and the dead with regards to the length of stay in the ICU and to ventilation, the differences are significant in the case of the suggestion group. However, as only in the case of JFK, this brought up the necessity of examining the data from a new perspective. The new hypothesis based on the differences discovered at this stage was well supported by our results: the effects of the suggestions could be best seen in the case of those patients who received psychological support based on positive suggestions (PSBPS) from the same psychologist in at least 50% of their days spent in hospital.

Half of the patients who participated in the study died in the two weeks after their discharge from the ICU, independently of the hospital or of the group they had been in (*Figure 4*). Therefore, in half of the cases mechanical ventilation proved necessary as part of end of life process. This is why we examined mortality and got results as expected: in the group who had the same psychologist those who died were statistically significantly older and in a worse condition than the survivors in the same group. This, they died because they were actually in a condition when it is natural. However, in the case of those who died in the control group, long mechanical ventilation was more significant, which could give way to iatrogenic harm. Considering the dead of the two groups, the dying process in the group with the same psychologist was 4.5 days shorter than those in the control group. This is notable for both humane and financial reasons.

It is a certain answer to PERUZZI's (2001) suggestion: we do not need to be able to estimate and take the responsibility to decide who is the one who can still expect a

better quality of life. Instead – while the chances of life are helped by invasive interventions – with calmness, information and PSBPS we provide to the patient in addition to their somatic therapy, we make it possible that instead of an artificial organising principle it be the natural order of life that prevails. This fulfils the aim suggested by KOLLEF (2000): the satisfaction of the patient as well.

5.4. Further suggestions implied by the results

It is absolutely necessary to conduct further studies in order to find the specific and well determined essential factor that helps in reaching better recovery results. This way it will be possible to teach the task of the psychologist working in the intensive care team. The usefulness of having a stable psychologist in the ICU is strongly proven by our results. This way it will also become possible to realise the further step that instead of the semi standard suggestions patients may get support tailored to their individual needs.

In addition, health care professionals – especially nurses who spend most time with the patients – can also be trained in many techniques. For this, however, it is also important to be aware of their condition, state, strengths, fears, problems and needs. If we apply the suggestive principle of pacing-leading with the staff first, they can be more easily expected to be motivated in learning the above mentioned suggestion techniques, last but not least making their own work easier and more pleasurable.

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