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Commissioned by "infactory innovations and trade GmbH" the "Siesta Group Schlafanalyse GmbH" carried out three studies explaining the principles behind the aXbo.

The Siesta group came into existence thanks to the cooperation of eight leading sleep laboratories in Europe from Barcelona to Finland, including the laboratories of the AKH Vienna (Vienna General Hospital), the Free University of Berlin and Marburg University with the aim of analysing sleep data. With the biggest pool of norm data of "normal sleepers" and extraordinarily precise measurement methods this association of European sleep specialists offers support in the research of sleeping disorders.

The first two studies were retrospective using the worldwide biggest norm data bank of healthy sleep from the Siesta Group. This norm data bank comprises sleep data of 200 healthy people from all adult age groups (20-90 years old), who were monitored for 14 days through actigraph (sensor for arm movements) and additionally spent 2 days in a sleep laboratory where their movements were registered. During the nights in the laboratory a sleep profile (a division of the night into different sleep stages) was established for every test person through a so-called polysomnography (analysis and diagnosis of sleep records). The details of the individual studies are as follows:

Study I

The objective of the study was to find out whether there is a significant correlation between movement and sleep phases.

F For this study the data of the aforementioned norm data bank of the Siesta Group was used and analysed. It was proved that on average the strength of the movements measured by the actigraph correlates with the sleep phases. In the light stage S1 there is on average more movement than in the slightly deeper stage S2 and in the "dream stage" REM. The movements in S2 and REM were more than in S3 and S4. Above all, it was important for aXbo to be able to distinguish the light sleep phases S1 and S2.

Results of the 1st study:
The most important result for aXbo was the significant correlation between body movements and the sleep phases relevant for waking up.

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Study II

The objective of the study was to find a correlation between the phase in which a test person is woken up or awakes and the personal feeling of well-being after waking up.

For this retrospective study the data of the Siesta Group was used and analysed again. It was proved that the individual feeling of well-being correlates directly with the wake up stage. Participants feel better awaking from S2 and REM than awaking form S1, S3 or S4. The difference of the wake up quality was significant between S1, S2 and S3.

Results of the 2nd study:
There is a significant correlation between the individual feeling of well-being and the stage in which a person is woken up or awakes.

After the first two studies (Study 1 and 2) the hypothesis behind aXbo were proved:

1) One can draw conclusions about the sleep phases by measuring the sleep movements.

2) Being woken up in particular sleep phases leaves you feeling better than in others.

Hence the aXbo was developed and the first series was produced.

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Study III

The objective of the third study was to investigate on the basis of the finished product to what extent waking up with aXbo differs from waking up with a "normal/regular" alarm clock in terms of the individual feelings of well-being.

Therefore for the first time a prospective study was made. 40 volunteers were woken up on four consecutive days with aXbo and made notes about how they felt in the morning on standardised questionnaires and scales which are commonly used in the sleep research.

Among the four days there was one day without waking up with aXbo ("basic night"). This first morning was just for familiarisation purposes. On one of the remaining days the aXbo did not wake the participants at the best wake up moment but at a random time within the thirty minutes time window. This morning had the function of a placebo (apparently effective but in fact ineffective waking). The morning on which day the subjects were woken by the placebo was chosen randomly in advance. The study was double-blind: neither the participants nor the directors of the study knew on which day the subjects were woken by the placebo.

Results of the 3rd study:
The study proved the functioning of aXbo. Compared to the basic night the participants were in significantly better mood and had more affectivity and less drowsiness in the mornings with the correct aXbo waking than when being woken randomly. These values were established by means of the standardized scale ASES, which the participants used for noting their feeling. **All these differences were statistically significant; hence it is legitimate to speak about a factual difference.**