

A comparative study of mental health of students working in chemical laboratories

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Abstract:

Students who work in chemical laboratories are exposed to many kinds of chemical hazards. Occupational exposures to hazardous chemicals in laboratories referred to as the 'Laboratory standard' specifically addresses mandated regulatory requirements. Many educational institutes, colleges, universities and industries uses hazardous chemicals in their laboratories are now required by the laboratory standard to develop chemical hygiene plans .Even though these organizations may follow chemical hygiene plans, some times workers and students have to perform experiments which are beyond the capacity of laboratory standard. Continuous exposure of these chemicals affects the mental health of people working in laboratories. The purpose of this study was to examine the difference in mental health of students in chemical laboratories and students having no laboratory work. We had selected 30 students each from science discipline, 30 togetherly from Arts and Commerce faculties, from N. V. P. Mandal's Arts, Commerce & Science College, Lasalgaon. It was found that students working in chemical laboratories were affected by bad odours, hazardous solids and gases, and found low level of mental health.

Introduction:

Mental health refers to an individual's emotional and psychological wellbeing. Marrian Webster defines mental health as "A state of emotional and psychological wellbeing in which an individual is able to use his or her cognitive and emotional capabilities function in society and meet the ordinary demands of everyday life". Students or people working in chemical laboratories have to undergo with hazardous solids, liquids & gases chemicals. These chemical exposures are unavoidable while doing experiments even though they follow laboratory hygiene standard. Some chemicals adversely affect on the health of those who handle them or inhale their vapors. Apart from overt poisons, numbers of chemicals are known to have various toxic effects on respiratory system, blood, lungs, liver, kidneys & the gastrointestinal systems. At the same time other organs and tissues may be adversely affected or seriously damaged. Some chemicals are known to be carcinogenic or teratogenic. It includes halogens, carbon dioxide, chlorinated hydrocarbons, ammonia, acetylene, acetic acid, hydrogen sulphide, aniline, sulphuric acid, chromic acids, nitric acids, peroxides and permanganates.

Some solvent vapours are toxic when inhaled. Apart from these more serious effect noted above, exposures many results in impairments that show no immediate discernible effect on health but can include lack of co-ordination, drowsiness & similar symptoms leading to increase proneness to accidents. Prolonged or repeated exposures to liquid phase of many organic solvents can result the skin damage. This may be due to defatting effect; the allergic and corrosive symptoms may also arise.

This effect prompted us to study the comparison between mental health of students from science discipline & nonlaboratory students from arts & commerce discipline. The chemical exposures to science discipline students have caused problems of adjustments and mental health.

Objective:

To compare mental health of students working in chemical laboratories and non laboratory students

Hypothesis:

The students working in chemical laboratories have low level of mental health.

Method:

Sample: In the present study researchers had chosen the samples of 60 students from N. V. P. Mandal's Arts, Commerce and Science college, Lasalgaon. Samples were grouped into two categories. The first group was consisted of 16 male and 14 female purely from arts and commerce disciplines. It was referred as group **A**. Similarly 30 students consisted of 16 male and 14 female randomly selected purely from science discipline, who were undergone to chemical exposure into laboratory during their regular practical work. This group was referred as group **B**. The age span of the sample ranged between 20 to 24 years. The minimum educational qualification of said samples was graduation level.

Tool: For this study, mental health inventory (MHI), Hindi version of Dr. Jagdish, Department of Psychology, R.B.S. PG. college, Agra and Dr. A. K. Shrivastav, Department of Psychology, BHU Varanasi was used. It was consisted of Questionnaire having 56 questions from different elements of mental health PSE, PR, PI, AUTNY, GOA & EM.

Procedure:

The samples from group **A** were tested at ordinary conditions. They had given MHI Questionnaire. After collection of data scoring was done.

As mentioned earlier, group **B** samples from science discipline, were exposed into laboratory for 6 hour duration. During that period, qualitative and quantitative analysis experiments were carried out. For that experiments students have handled hazardous chemicals such as acids, bases, phenols, haloalkanes, volatile solvents like petroleum ether, benzene, chloroform, formaldehyde, carbon tetrachloride, dimethyl sulphoxides, and dimethyl formamide. The gases carbon dioxide, hydrogen sulphide, ammonia, greenish yellow coloured chloride, brown coloured bromine, violet coloured iodine were evolved. Reference study shows that these gases cause adverse effects on mental health. After 6 hour span, these students were tested for MHI questionnaire. After collection of data, appropriate stratified technique was used in the treatment of data.

Results and Discussion:

Statistical study on data obtained in present indicates that overall mental health of both students from group **A** as well as group **B** has found an average mental health. There is no significant difference between group **A** and group **B** students.

Table No.: 1

**STATASTICL ANALYSIS OF MENTAL HEALTH OF STUDENTS :
MENTAL HEALTH OF STUDENTS FROM ARTS & COMMERCE FACULTY (GROUP
A)**

SAMPLE NO.	PSE	PR	IP	AUTNY	GOA	EM	TOTAL
S1	31	22	29	16	33	32	163
S2	37	23	37	22	25	34	178
S3	31	21	24	18	16	23	133
S4	25	19	25	12	23	20	124
S5	31	16	26	18	22	28	141
S6	31	19	26	16	25	26	143
S7	35	26	42	22	32	26	183
S8	38	14	34	14	27	26	153
S9	34	20	34	17	26	27	158
S10	31	20	34	13	27	29	154

S11	40	23	40	21	34	29	187
S12	36	27	42	18	33	31	187
S13	38	20	37	23	32	28	178
S14	36	25	35	20	34	31	181
S15	34	23	35	16	28	32	168
S16	34	23	31	18	24	29	159
S17	26	23	32	15	29	24	149
S18	34	23	34	17	27	28	163
S19	25	21	33	16	28	30	153
S20	37	25	42	23	36	31	194
S21	23	22	30	15	25	25	140
S22	25	22	34	13	27	31	152
S23	34	23	26	23	31	32	169
S24	30	21	44	20	40	35	190
S25	25	20	24	15	27	30	141
S26	40	19	44	20	28	29	180
S27	30	20	42	20	31	27	170
S28	35	22	28	18	31	29	163
S29	25	26	35	13	36	26	161
S30	39	18	43	19	27	28	174
TOTAL	970	646	1022	531	864	856	4889
AVERAGE	32.33333	21.53333	34.06667	17.7	28.8	28.53333	162.9667

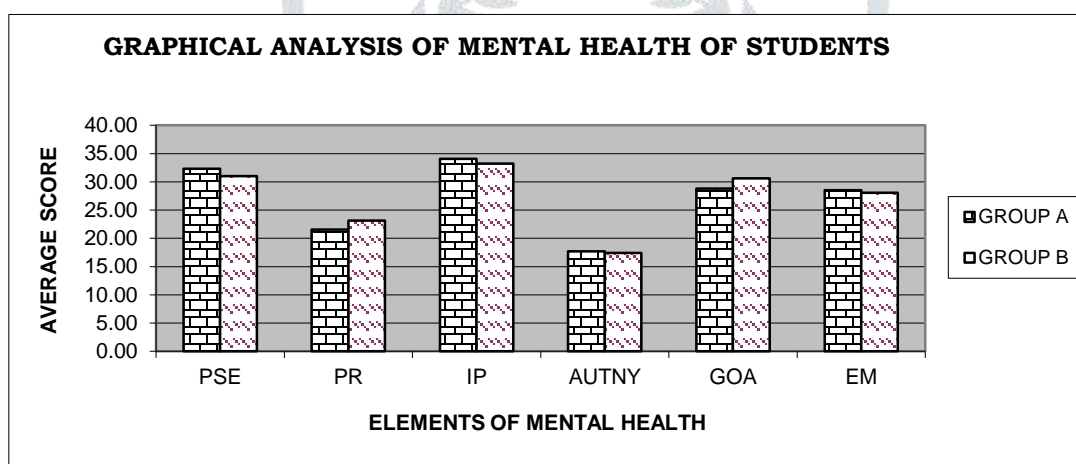
But on the basis of dimensions of mental health, PSE of group A students have scored more than the group B. It may happen due to the large exposure of group A students in the society. Another reason may be that group B students are over burdened due to the vast study and experimental work in laboratory. This type of study and experimental work is not related to group A. PR of group B shows significant difference. It is higher with respect to group A. This may be because of these students habitual to study reality or evidences through experiments. As far as IP and AUTNY are concerned group B students, there is negligible difference. It is lower than group A. It may be due to less exposure in society and continuous heavy work to group B students.

TABLE NO.: 2

**STATISTICAL ANALYSIS OF MENTAL HEALTH OF STUDENTS :
MENTAL HEALTH OF STUDENTS WORKING IN CHEMICAL LABORATORY
(GROUP B)**

SAMPLE NO.	PSE	PR	IP	AUTNY	GOA	EM	TOTAL
S31	30	26	37	17	33	28	171
S32	34	29	39	19	32	30	183
S33	36	23	25	19	31	25	159
S34	27	18	25	14	33	28	145
S35	30	18	30	18	28	29	153
S36	27	24	39	19	25	28	162
S37	32	22	28	12	26	28	148
S38	30	27	33	20	27	32	169
S39	32	21	25	19	31	24	152
S40	26	25	37	14	32	21	155
S41	32	25	39	20	30	27	173
S42	27	22	31	19	22	22	143

S43	33	14	32	13	24	29	145
S44	33	20	34	14	28	26	155
S45	29	27	41	19	33	30	179
S46	36	23	36	18	34	27	174
S47	33	23	40	21	37	32	186
S48	31	22	29	13	30	24	149
S49	35	25	36	20	34	31	181
S50	34	22	30	13	30	32	161
S51	30	24	35	17	30	28	164
S52	26	24	38	17	29	30	164
S53	27	24	32	19	34	29	165
S54	30	16	31	18	31	29	155
S55	32	23	30	14	31	31	161
S56	31	21	35	19	35	27	168
S57	36	30	33	22	36	32	189
S58	32	24	39	22	34	27	178
S59	28	25	31	19	29	27	159
S60	31	27	27	15	29	29	158
TOTAL	930	694	997	523	918	842	
AVERAGE	31	23.13333	33.23333	17.43333	30.6	28.06667	167



GOA of group B is found higher as compared to group A. It is because of students from science discipline who have to perform practical work and these students discuss results of their experiments with each other.

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